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**CONCEPT OF MATTER
IN
JAINA PHILOSOPHY**

J. C. SIKDAR

**P. V. RESEARCH INSTITUTE
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Editor
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Concept of Matter in JAINA PHILOSOPHY

By

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Dedicated
to
My Late Ācāryas
Prof. Satyendra Nath Bose
Prof. Dr. Dhirendra Mohan Datta

Publisher's Note

We feel immense pleasure indeed in presenting this valuable work—‘The Concept of Matter in Jaina Philosophy’ by Dr. J. C. Sikdar in the hands of the scholars. It is also a matter of honour for us that on this work the author was awarded D. Litt Degree by Jabalpur University, Jabalpur.

Jaina Ācāryas have contributed to almost all the branches of the knowledge including Physical sciences also but unfortunately this aspect remained unexplored. No serious attempt has been made by scholars in this specific field. It is gratifying that this subject is for the first time exhaustively dealt by Dr. J. C. Sikdar. The beauty of this work lies in its searching analysis and critical and comparative approach to various problems related to the concept of Matter in Indian thought—philosophical as well as scientific. Through this work author has really made a valuable contribution to Indian Scientific thought in general and Jainism in particular. We hope that this work will serve as a landmark and will succeed in arousing the interest of the scholars in the field.

We are extremely grateful to Dr. J. C. Sikdar for allowing P. V. Research Institute to publish this work.

We express our deep sense of gratefulness to Sādhvi Śrī Mṛgāvatī Śrī Ji for arranging a grant of Rupees Seven thousand for publication of this work in the memory of Pūjya Sādhviji Śrī Silavatiji Mahārāja Sāhiba.

We are thankful to Dr. Arun Pratap Singh, then Research Associate, P. V. Research Institute and other academic staff of the Institute who have helped in one way or the other in the publication of this work.

We are also thankful to Sri Mahesh Kumar of Divine Printers who has been very instrumental in proof-reading and printing of the book.

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Director

SĀDHVĪ SŪRI SILAVATIJI

Twenty fourth Tīrthaṅkara Lord Mahāvīra, being an advocate of the cause of spiritual upliftment of women, included nuns and lay-women in his four-fold Order. Consequently, a great number of women excelled themselves in austerities and spiritual development and stood at par with monks in learning and prominence. From the time of Mahāvīra to present age the nuns have always outnumbered the monks. In the recent past revered Ācārya Vallabha Sūri also laid great emphasis on the spiritual upliftment of the nuns of his order. Among his nun-disciples pujyā Sādhvī Sūri Silavatiji was an intelligent, vigilant and of sound character.

She was born at village Ranaparada in Saurashtra, the land of saints and heroes. Her earlier name was Sivakunwar Bahen. From early childhood she was very religious in her temperament. She was married to Shri Dūngarasibhai of Saradhāra. Her family life was quite harmonious and the couple had everything at their disposal required for leading smooth and comfortable life. They had two sons and two daughters. But unfortunately, the ruthless axe of destiny fell on her and Dūngarasibhai departed in 1927 A. D. Bereaved Sivakunwar Bahen had to bear the responsibility of bringing up her children. Already broken with a miserable widowhood she was struck with another severe blow when her two issues—a daughter and a son passed away in 1928, within a year of her husband's demise. A final stroke she received when her only remaining son also expired.

Having realised the futility of this mortal world. She yearned for renunciation of the world and decided to lead an ascetic life. She was initiated with her only living daughter in 1928 at Satrunjaya Hill and started her new life as a nun with

her daughter-disciple, who became a renowned Jaina Sādhvī Mahattarā Mṛgāvatī Śrījī. Āryā Śīlavatījī devoted herself to the study of spiritual texts and religious practices. Though her knowledge about the canonical Prākṛta texts was not much deeper yet she had sound knowledge of Jaina works composed in Gujarati. She was well versed in telling religious short stories. She made special arrangements for the study of her daughter-desciple, Sādhvī Śrī Mṛgāvatījī under the supervision of Pt. Sukhalalji and Pt. Bechardasjī. Sādhvī Śrī Śīlavatījī toured all over Gujarat and Punjab. The people of Punjab had a great respect for her. When the Golden Jubilee celebrations of Mahāvīra Jaina Vidyālaya, Bombay, founded by her guru Pūjya Vijayavallabha Sūrijī, were accomplished, she left for heavenly abode on 17. 2. 1968 at the age of 69.





Pujya Sādhvī Śrī Śilavatī Śrījī

Dikṣā 1928

1968 AD.

PREFACE

The Concept of Matter has been treated by every system of thought in its own way from the noumenal and phenomenal aspects as it exists in space and continues in time with all its qualities and modes. This subject has not so far been exhaustibly studied from the metaphysical and physical points of view on the basis of the sources of both the Jaina Āgamas and the post-āgamic works, although Dr. B. N. Seal, Prof. G. R. Jain, Śrī Mohanlal Bauthia, Dr. Harisatya Bhattacharya and other scholars made brief appraisal of it in their respective works—‘The Positive Sciences of the Ancient Hindus’, ‘Cosmology—Old and New’, ‘Jaina Padārtha Vijñāna men Pudgala’ and ‘Reals in the Jaina Metaphysics’ in course of their studies in Jaina thought on this problem.

In the āgamic period the Jaina conception of Matter formed the foundation-stone of Jaina physics in a nascent form on a metaphysical basis. On it a superstructure of ‘Concept of Matter in Jaina Philosophy’ had been raised in the post-āgamic period which commenced with the time of Umāsvāti and continued through out the period of the later Jainācāryas. It has been much developed in the light of the concept of Matter as embodied in other Indian philosophies with the progress of speculative thought, having kept in view the historical background of all their notions on this subject.

In Jaina philosophy, Matter has been analysed on the basis of its conception as a permanent substance possessing infinite qualities and modes with many unique notions about it as found in the physical sciences. The Jaina concept of Matter is flexible to some extent, as is shown by its comparative study with the concepts of Matter in physics and metaphysics where it has passed through a series of developments into a meaningful stage of dynamic reality of the present day.

A study of ‘Concept of Matter in Jaina Philosophy’ throws

an important light upon many problems of Indian philosophy and thought, and more particularly in the field of the physical sciences by revealing its various aspects, such as, conception of Reality—Substance, quality and mode (Dravya-guṇaparyāya) and their inter-relation, nature of Reality, categories of Reality, concept of Matter, its elements, Indriyas (sense-organs), karma (Karmic matter) and leśyā (condition of soul), and atomism, properties of Matter, its effects and modifications, and classification, atomic structure and properties of atom, transformation of Matter, its combination and value of the Jaina concept of Matter.

The structure of the thesis on the subject 'Concept of Matter in Jaina Philosophy' has been divided into ten chapters. The first chapter deals with the concept of Matter with an introduction by throwing light on the Jaina conception of Reality—Dravya (substance), guṇa (quality) and paryāya (mode) and their inter-relation, nature of Reality and its categories in brief with a comparative study of these problems as treated in other Indian systems of thought and western philosophy, revealing similar views on them. With this background the topic has been discussed in the subsequent chapters in the light of the concept of Matter as embodied in other Indian metaphysics and the physical sciences as far as possible to explain and interpret the metaphysical and physical aspects of the Jaina concept of Matter in an approach to them by a comparative study of the whole problem.

The universe is a system of reals, all inter-related with one another from the points of view of dravya (substance), kṣetra (locus or field), kāla (time) and bhāva (condition) having a unity comprising the plurality of interdependent and interconnected substances. Dravya (Substance) means Reality characterized by Sat (existence), endowed with guṇa (quality) and paryāya (mode) and coupled with utpāda (origination), vyaya (decay) and dhrauvya (permanence). The undivided whole of infinite qualities and modes only is conceived as Dravya (Substance), i.e. a collective whole of each individual

paryāya (mode) and of such capacities is called Dravya from the point of view of difference among them. But Dravya is gunaparyāyavat from the point of view of non-difference among them because of paryāya being like their own causative gunas and gunas being like Dravya. That is to say, Dravya, guna and paryāya are different from one another from the subjective point of view, but non-different from the objective point of view.

Thus Dravya (Substance) is the crux of Jaina Metaphysics and Physics in particular and a central theme of some Indian systems of thought in general, while substance (i.e. Dravya) is the pivotal point of philosophy of Spinoza and Prof. Bertrand Russel. It was natural for the Jainācāryas to begin their metaphysical inquiry into the problem with the notion of Dravya, a notion which has a continuous history in Jaina philosophy from its very beginning upto the present time as is found in the case of notion of substance from Aristotle to Descartes.

The Jaina concept of Dravya compares well with that of substance of Spinoza, the central theme of his metaphysics, "A substance, all of whose attributes and modifications can be deduced from its own essential nature, and all whose attributes are necessary and not contingent, can be described as cause of itself, (cause sui) and only such a substance can be so described". Prof. Bertrand Russel defines a substance as "that which can only enter into a proposition as subject, never as predicate or relation. Metaphysically, substances have generally been held to be indestructible."

According to Jaina metaphysics, an entity has got two aspects—permanent and non-permanent, static and dynamic. It undergoes change without giving up its essential nature. In the experience of life all entities appear to be permanent-in-change. Dravya as Reality has two aspects—permanent and non-permanent. If Jīvadravvas (living substances) and Ajīvadravvas (non-living substances) were devoid of modifications, there would have never occurred the variabilities in the Universe as a united form of these two realities. Hence the principle of per-

manence-in-change in Dravya is conceived by Jaina metaphysics as logical. Sat is the differentia of Dravya, characterized by origination, decay and permanence. It is an objective reality and the highest universal because of being a unifying principle of all existents under the concept of 'being-existent' on a common objective foundation of existence itself. Therefore, the nature of Dravya—Reality is that it is characterized by origination, decay and permanence.

The Concept of Dravya has been studied from the noumenal and phenomenal points of view in the light of the doctrine of manifoldness. Dravya has been conceived by the Jainas as a universal principle of Reality from the aspect of generality, while its particular characteristics are Jīvadravya (living substance) and Ajīvadravya (non-living substance) from the particular aspect. Except the extreme views of monistic materialism of the Cārvākas and monistic spiritualism of the Vedānta, other Indian systems of thought have accepted two aspects of Reality, viz. Cetanatattva (sentient principle) and Acetanatattva (non-sentient principle). It is to be noted that Jīvadravya and Ajīvadravya of Jaina philosophy do not form any two substance-doctrine, representing the world of animated substances and non-animated substances as independent and self-contained systems. According to a similar concept of a unique substance, "thinking substance and extended substance are one and the same substance, comprehended now under this attribute, now under that."

In accordance with the Jaina conception of Reality having Jīvatattva (sentient principle) and Ajīvatattva (non-sentient principle) as its two aspects, six substances have been accepted as six categories of Reality, viz. Jīva (Soul), Dharma (Principle of motion), Adharma (Principle of rest), Ākāśa (Space), Pudgala (Matter) and Kāla (Time), from the point of view of their respective natures. Nava dravyas (nine substances) of the Vaiśeṣika philosophy, viz. earth, water, fire, air, space, time, direction, soul and mind, can be reduced to Śat-dravyas (six substances) of Jaina metaphysics. They are the constituents

of the Universe. The five extended substances (*pañcāstikāyas*—Principle of motion up to Matter) and Time (*kāla*)—the sixth substance are permanent in their nature and fixed in number as the sole constituents of the Universe. All except Matter are non-corporeal, i. e. they are not endowed with its characteristics—colour, taste, smell and touch, etc. In the midst of the series of eternal and infinite changes occurring in them, they persist as substances—permanent-in-change (*parināmītyadravyas*), for they are eternal, independent and permanent categories of Reality from the substantial point of view, yet they are also changing in nature from the modal point of view.

Dharmāstikāya and *Adharmāstikāya* (principles of motion and rest) are the neutral and conditional causes of motion and rest respectively of *Jīva* (Soul) and *Pudgala* (Matter). *Ākāśa* is that which functions as locus in which other substances manifest themselves or exist with their respective modes without exception or itself gives room to them. *Jīva* (Soul) is a colourless, smellless, tasteless and touchless, non-corporeal, living eternal and permanent and constant substances of the Universe, having an attribute of consciousness. *Pudgala* is conceived as a permanent substance as well as stuff of which the material universe is constituted, undergoing changes by the process of integration and disintegration. *Kāla* (Time) is accepted as an objective reality. It is one substance having an infinite number of moments as its states. It is constitutionally dynamic in the sense that it changes into moments by virtue of its intrinsic constitution like other substances. The concept of time as mode is inspired by the modal point of view, for it is opined that moments emerge and perish without relation to any underlying continuing substance.

Bhūta of the *Cārvākas*, *Prakṛti* of the *Sāṃkhya-Yoga*, *Jada-dravya* of the *Nyāya-Vaiśeṣika* and the *Mimāṃsakas*, *Rūpa* of the Buddhists, *Māyā* of the *Sāṅkara-Vedānta*, *Acit* of the *Rāmānuja-Vedānta* and *Pudgala* of *Jaina* philosophy are only diverse views on the subject—Matter.

A comparative study of the Jaina concept of Matter with those of other Indian systems of thought and the physical sciences reveals that it comes nearer to the concept of Matter of the physical sciences, as it is conceived as the substance in the sense of stuff of which the universe is constituted. It is one of the ultimate principles or substances of which phenomena are manifestations.

Matter is conceived by Jaina metaphysics as eternal, non-living, extensive, corporeal, concrete, active, subject to dissociation and combination, changeable, infinite, co-extensive with the Universe, possessed of the capacity to be received by Soul and to be of assistance to it. Its function is to form the basis of the body and the organs of speech, mind and respiration and also to contribute to pleasure, suffering, life and death of living beings.

The second chapter makes an analysis of the elements of Matter in the light of the conceptions of the elements of Matter as embodied in other Indian philosophies and the physical sciences by making comparative study of this problem. Jaina *Pudgala* represents the elements of Matter. Earth, water, shadow, the objects of the four senses—sense of hearing, sense of smell, sense of taste and sense of touch, except the sense of sight, karmic matter and atom (*paramāṇu*) constitute the material universe in the forms of molecules and discrete atoms. Earth, water, fire, air, and *ākāśa* (ether) have been accepted by other Indian systems of thought as the elements of Matter.

There appears to be a close relation of the structure of elements of Matter conceived by Jaina metaphysics with those of elements of Matter as embodied in other Indian philosophies.

The third chapter deals with the problem of *Indriyas* (sense-organs), *Karmapudgala* (Karmic matter) and *Leśyā* (condition of Soul). A comparative study of *Indriyas* by all Indian systems of thought reveals that the Jaina concept of *Indriyas* analysed from the physical and psychical aspects is more subtle and tho-

ught-provoking, as they have been accepted as representing translucent matter.

Karmapudgala is conceived in Jaina metaphysics as material energy like Apūrva of the Mīmāṃsā and Avijñapti (unmanifested matter) of the Buddhist philosophy from the physical and psychical aspects (aspects of dravyakarma and bhāvakarma). There is no objection of any Indian system of thought in regard to Bhāvakarma (psychical karma =action). In the opinion of all the Indian philosophies rāga (attachment), dveṣa (aversion) and moha (delusion) are Bhāvakarma or the causes of Karma. That which is called Dravyakarma (physical karma =action) by Jaina metaphysics is called Karma by other Indian philosophies, Saṃskāra (force), Vāsanā (desire), Avijñapti (unmanifested matter), Māyā (Illusion) and Apūrva (Energy) are the different names of it. There is no particular dispute with regard to the entity—Karma, although there is a difference of opinions of the Indian philosophers on this point whether karma is material substance or quality or essential character or any other independent substance.

In Jaina philosophy Leśyā is conceived as the condition of Soul—physical (dravyaleśyā) as well as psychical (bhāvaledśyā). As to the nature of Dravya-leśyā there are three views viz. (1) Leśyādravya is composed of Karmavargaṇās (Karmavargāṇāniśpanna), nevertheless, like the karmic body it is different from eight kinds of Karma—Jñānāvaraṇīya, etc. (2) Leśyādravya is the current (or continuity) of binding karma (karmaniṣyanda). Even there being karma in the fourteenth stage of spiritual development in the absence of its current, there is a possibility of the negation of Leśyā at the stage of spiritual development, and (3) Leśyādravya has been accepted as independent, belonging to yogavargaṇā (class of activity) (Yogapariṇāma).

The fourth chapter treats of the subject ‘Atomism’ by making a comparative study of all the Indian concepts of atom and those of western metaphysics and physics in relation to Jaina Atomism. The Indian thought on Atomism reflects a stage

of the emergence and development of Indian philosophy of a period in the field of metaphysical knowledge, when the speculative Indian mind with logical nicety went on to search out the basic principle of dissolution and creation of the material universe. In this speculation the Sāṃkhya-Yoga, Vaiśeṣika, Nyāya, Mīmāṃsaka, Baudha, Vedānta and Jaina systems of thought have attacked the problem from their respective angles of vision and made attempts at the explanation and interpretation of the root cause of Atomism. The Cārvākas have admitted four or five elements of Matter as the basis of creation with a support for Atomism.

A study of Atomism of all the Indian systems of thought reveals that Jaina philosophy is the advocate of the atomic theory like the Nyāya-Vaiśeṣika. Nevertheless, the nature of atom conceived in this school of thought is not identical with that of atom of the Nyāya-Vaiśeṣika. But it compares well with the nature of Prakṛti of the Sāṃkhya, for atom of this philosophy is transformable like Prakṛti of the Sāṃkhya. On this ground atom of the Jainas changes into many forms like earth, water, fire, etc. just as Prakṛti is the material cause of many effects, such as, earth, water, fire, air, etc. It is not admitted by Jaina philosophy that the material atoms like earth-atoms, water-atoms, etc., are always basically of different classes. Atom of Jaina metaphysics is finer than atom of the Nyāya-Vaiśeṣika, but it is unmanifest like Prakṛti of the Sāṃkhya. Anantaparamāṇuvāda (concept of infinite ultimate atoms) of Jaina philosophy is not far from but nearer to the concept of infinite plurality of Prakṛtis of the early Sāṃkhya (with regard to the plurality of Puruṣa), i. e. "each being attached to a different Puruṣa (Self)." The phenomenalist atomic conception of the Buddhist philosophy is contrary to the substantive atomic theory of the Jaina, Nyāya-Vaiśeṣika and other Indian systems of thought. As regards the antiquity of Atomism, Jaina Atomism is earlier than Greek Atomism.

The fifth chapter deals with 'Properties of Matter'—general properties, motion and oscillation of Matter in the light of

the views of the physical science on them by making a comparative analysis of them with those of Matter as conceived by other Indian systems of thought. Properties are the characteristic qualities of Matter. Colour, taste, smell and touch are general qualities inherent in atom as well as molecule. Certain physical properties are stated to be possessed by molecules only, such as, grossness, shape, weight, divisibility, porosity, compressibility, density, elasticity, etc. Cohesiveness (attractive force) and dryness (repulsive force) impenetrability and extension are the common properties belonging to both atoms and molecules. Besides, Matter is possessed of the nature of mobility and immobility. Motion of a material body is determined by its successive positions in time. There takes place oscillation in atoms and molecules, and their motion occurs along with a straight line as well as a curved line. There take place uniform horizontal and vertical motions of free fall and translatory, curvilinear, rotatory and complex motions of Matter.

The sixth chapter makes a study of the effects and modifications of Matter in the light of the views of the physical sciences on them in comparison with those of other Indian philosophies regarding them. Matter exists in Nature occupying some volume in perceptible and imperceptible conditions in various forms of effects and modifications within the sensuous and supersensuous experiences. Its effects are stated to be earth, water, fire, air, vegetation and bodies of mobile beings, body, organs of speech, mind and respiration, while its modifications manifest themselves as sound, combination, fineness, grossness, shape, division, darkness, shadow, heat, light, etc. Modification belongs to both substance and its quality (dravya and guna). There are stated to be infinite modifications of Matter from the points of view of substance, state, immersion, duration and quality—colour, taste, smell and touch, etc.

A study of the modifications of Matter from these stand-points appear to be thought-provoking when compared to the

modes or relations of the material substance as dealt within the physical sciences.

In the seventh chapter Matter has been classified into one, two, three, four, six, twenty-three, five hundred thirty and infinite groups respectively from the points of view of (1) dravya (substance), kṣetra (locus), kāla (time) and bhāva (condition), (2) atomic and molecular forms of its existence, (3) apprehensibility and inapprehensibility, receivability, and non-receivability, etc., (4) transformation, (5) parts of molecules, (6) grossness and fineness, (7) vargaṇā (grouping), (8) prominence of particular quality and (9) gati (class), part of quality and mode.

The eighth chapter deals with the atomic structure of Matter and properties of atom, causative and ultimate discrete atom, the nature of atom in the light of the nature of Matter in comparison with the nature of atom of the Sāṃkhya-Yoga, Nyāya-Vaiśeṣika, Buddhist systems of thought, group of atoms according to their qualities, contact of atoms, vibration and motion of atom, speed of motion of atom, motion of atom by touching other forms of matter, resistance of Matter, non-resistance of atom and Nyāya-Vaiśeṣika view of motion of atom, etc. in continuation of the fourth chapter on Atomism. Atom is studied from the points of view of dravya (substance), kṣetra (locus or field), kāla (time) and bhāva (condition) with a comparative analysis of its concept of structure and properties as revealed in other Indian systems of thought and the physical sciences to some extent. An atom is partless, finest, discrete, beginningless particle of Matter corresponding to one space-point and one unit of time. It is endowed with the inherent qualities—colour, taste, smell and touch. It is infinite in number from the point of view of dravya (substance), a finest particle of Matter from that of kṣetra (locus), a momentary unit of time from that of kāla (time) and its qualities are ever changing in nature from that of bhāva (condition). Atom is the cause of the formation of molecule; it also comes into being out of the division of a molecule at last. Hence it is

the smallest and finest form of Matter and it is permanent. It is eternal from the point of view of dravya (substance) and non-eternal from that of bhāva (condition) of colour, smell, taste and touch.

Atoms are called kāraṇāṇu (causative atom) from the point of view of combination, and anantāṇu (ultimate discrete atom) from that of dissociation.

An atom is a substance and it is attributed by the name 'Dravyaparamāṇu. It is permanent and constant in number, for it does not give up its individuality and class, even undergoing transformation into a molecular form. It is non-living and it possesses existentiality which is inferable by the mark of its effect. It is devoid of mass, but it possesses the capacity to assume the form of mass by combining with other atoms.

An atom is acarama (not-last) from the aspect of dravya (substance), somehow carama (last) and somehow acarama (not-last) from those of locus, time and condition. An atom is partless with regard to dravya and also partless with regard to kṣetra (locus) invariably, it is partless in some respect and is having part in other respect with regard to kāla (time); it may be partless and it may have parts with regard to bhāva (condition) from the point of view of space-point.

As to property an atom is indivisible, incombustible, impenetrable or impassable, inapprehensible and non-receivable by soul. Here it appears that sūkṣmaparamāṇu is indivisible, etc. but Vyavahāra-paramāṇu which consists of infinite sūkṣma-paramāṇus seems to be divisible. An atom may be a single discrete unit of the material substance or a part of it. It is an ultimate cause and an eternal form of Matter having one colour, one taste, one smell and two touches. It is eternal from the point of view of dravya (substance) and non-eternal from that of bhāva (state or mode) of colour, taste, smell and touch. It is itself beginning, it is itself middle; it is itself end. It has got no dimension. Its motion is possible everywhere in the universe, that is way it is called Lokapramāṇa (extensive with the universe).

Atoms are infinite in number, but there is no fundamental difference among them like earth-atom, water-atom, etc. of other Indian systems of thought. An atom can assume any form according to the cause. There is no class-distinction among atoms of Jaina metaphysics. The capacities like colour, taste, smell and touch are equal in each and every atom and it can undergo transformation into any form according to the cause. Even though these capacities are equal in all of them, the varieties of their transformation take place due to the cause of the difference of materials. An aggregate (molecule) formed by a combination of atoms is not a new substance. It is only a particular form out of an aggregation of atoms. All atoms are permanent in their respective individual nature and they are changeable in nature as a result of their transformation in the forms of aggregate, quality and mode. All gross and fine material entities are explained on the basis of the capacity of transformation of infinite atoms and their combination and separation. Infinite atoms can exist in one point of space by their capacity of contraction (*samkoca*) or becoming finest. Being finest, they are infinite and smallest and all-pervading.

When an atom touches another one, the whole of it touches the whole of the latter; for there cannot be a conception of point in point. Atoms are always in a state of flux, because of their revolution, movement and combination with and dissociation from one another to transform themselves into molecules. A resistance to the motion of an atom is obtained by it (1) when it is resisted by another atom on its way of motion, (2) due to its property of dryness (repulsive force) and (3) at the last border of the universe because of the non-existence of Dharmāsti-kāya (Principle of motion) in the Non-Universe (Aloka).

The ninth chapter makes a treatment of the topic 'Transformation of Matter' by a comparative study of this problem with the views of other Indian systems of thought and the physical sciences on it. Matter undergoes transformation in respect of its qualities and modes. An atom having equal quality transforms another atom having equal but dissimilar quality because

of its combination with another atom or molecule. An atom having higher degrees of qualities transforms another atom having lower degrees of qualities. Some molecule is formed by the process of combination of atoms, some by the process of dissociation and some by both the processes.

The tenth chapter deals with the subject, 'Combination of Matter' according to some rules laid down in both the Śvetāmbara and Digambara works. A combination of atoms occurs as a result of the chemical behaviour of their properties of unequal degrees, i. e. cohesiveness (*snigdhatva*), dryness (*rükṣatva*) and cohesiveness-cum-dryness (*snigdhatva-rükṣatva*) which are inherent in atoms and molecules both having two to infinite units. A production of the material aggregates like dyad, triad, tetrad, etc. takes place due to a mutual contact and combination of discrete atoms, etc., endowed with the properties of cohesiveness (i. e. attractive force) and dryness (i. e. repulsive force). There take place two kinds of combination of cohesive and dry constituents of Matter, viz. similar (*sadṛṣa*) and dissimilar, (*visadṛṣa*), i. e. (1) a combination of a cohesive constituent with another cohesive one or that of a dry constituent with a dry one and a combination of a cohesive constituent with a dry one are called similar and dissimilar combinations respectively. The general rules of the combination of forms of Matter are as follows : (1) There does not occur a combination of the cohesive and dry constituents of Matter having a quantum of minimum properties. (2) There does not take place a combination of similar constituents of Matter, because of there being an equal quantum of properties. (3) Atoms having an equal degree of cohesiveness or dryness and being of the same kind, cannot combine with atoms of their own kinds. (4) There occurs a combination of similar or dissimilar constituents of Matter, having a difference in their degrees of cohesiveness or dryness by two units more.

The combination and dissociation of atoms and molecules always take place according to these rules. As a result of integration and disintegration of atoms there can take place infinite

tefold union of atoms with the material substances (pudgala parivartas of paramāṇus).

In conclusion an estimation of the value of the Jaina concept of Matter has been made by making a comparative study of it with the concepts of Matter as embodied in other Indian systems of thought and the physical sciences with regard to its nature, elements, atomism, properties, effects and modifications, classification, atomic structure and atomic properties, motion, vibration and oscillation, its transformation and combination. The value of Jaina concept of Matter lies in the fact of its scientific approach to the problem of this permanent substance with its noumenal and phenomenal aspects from the points of view of dravya (substance), kṣetra (locus), kāla (time) and bhāva (condition), as it exists in space and continues in time with its static and dynamic forces in the cosmic universe.

The study of 'Concept of Matter in Jaina Philosophy'* was suggested to me by the late National Professor Śrī Satyendra Nath Bose, Ex-Vice-Chancellor of Visva-Bharati University, Santiniketan, in course of my discussion with him on the Jaina concept of Matter, while reading some aspects of it to him from my Ph. D. thesis 'Studies in the Bhagavati Sūtra' at his residence in Calcutta in 1961. Fortunately, I was awarded a Senior Research Fellowship by the University Grants Commission, Government of India, on the 6th November, 1963, to carry on my research studies in my long cherished subject 'Concept of Matter in Jaina Philosophy' at the Institute of Languages and Research, University of Jabalpur, under the supervision of my late revered teacher, Dr. Hiralal Jain, M. A., LL. B., D. Litt., Professor and Head of the Department of Sanskrit, Pali and Prakrit, Dean of Faculty of Arts, University of Jabalpur.

* The Title of this D. Litt. thesis 'Doctrine of Matter in Jainism' has been changed to "Concept of Matter in Jaina Philosophy" for publication as it is more appropriate in the light of its study.

In spite of some difficulties for not finding some of the necessary reference-books, journals, periodicals, etc. in the library of the Jabalpur University, as it was in the formative stage, I worked on my proposed subject 'Concept of Matter in Jaina Philosophy' under the mature guidance of my revered teacher, Dr. Hiralal Jain and completed my thesis for the D. Litt. Degree within proper time.

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Jogendra Chandra Sikdar

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ABBREVIATION

Abh	=	Abhidharmamṛtaśāstra
Abh. D	=	Abhidharmaḍīpa
Abh. K.	=	Abhidharmakośa
Asl.	=	Atthasalini
Bhs.	=	Bhagavatī Sūtra (Vyākhyā Prajñapti)
BR.	=	Bhāṣārahasya
BS.	=	Brahmasūtra
Bhā	=	Bhāṣya
Comm.	=	Commentary
Cph.	=	Compendium of Philosophy of Mr. Aung.
Dhs.	=	Dhammasaṅgani
DS.	=	Dravyasaṅgraha
ERE	=	Encyclopaedia of Religion and Ethics
GS.	=	Gommataśāra
Gā.	=	Gāthā
H.	=	Hindi
H. I. Ph	=	History of Indian Philosophy
Jīva	=	Jīvakāṇḍa
KR.	=	Kaṇādarahasya
KV.	=	Kiraṇāvalī
KV. Bha.	=	Kiraṇāvalī Bhāskara
Kā	=	Kārikā
LP.	=	Lokaprakāśa
Loka	=	Lokaprakāśa
Majjh	=	Majjhimanikāya
Mbh.	=	Mahābhārata
MK.	=	Madhyamakakārikā

NBhā.	=	Nyāyabhāṣya
NK.	=	Nyāyakandali
Nku.	=	Nyāyakusumāñjali
N Kub.	=	Nyāyakusumāñjalibodhini
NLV.	=	Nyāyallāvatī
NLVK.	=	Nyāyallāvatīkanthābbaraṇa
NM.	=	Nyāyamañjarī
NP.	=	Nayanaprasādini
NS.	=	Nyāyasūtra
NV.	=	Nyāvārtika
NVTT.	=	Nyāvārtika Tātparyatīkā
Pañña.	=	Pañnavāṇa
PBhā.	=	Pravacanabhāṣya
PPBhā.	=	Praśastapādabhāṣya
PPV.	=	Pravacanapradīpikāvṛtti
PR.	=	Pravacanasāra
PRTV.	=	Pravacanasāra pradīpikā Tīkāvṛtti
PS.	=	Pañcāstikāyasāra
PSAH.	=	Positive Sciences of the Ancient Hindus
PTN.	=	Padārthatattvanirūpaṇa
PV.	=	Paññavaṇa
RV.	=	Rājavārtika
Sat.	=	Śatkhandaṅgama
SS.	=	Sarvārthaśiddhi
SBhā	=	Śāṅkarabhbāṣya
Śl.	=	Śloka
Sthā.	=	Sthānāṅga
Sū.	=	Sūtra
TK.	=	Tattvakaumudī

Abbreviation

TP.	=	Tattvasaṁgrahapañjikā
TRV.	=	Tatvārtha Rājavārtika
TS.	=	Tattvārthādhigamasūtra
TSBhā.	=	Tattvārthādhigamasūtra Bhāṣya
Utt.	=	Uttarādhyayanasūtra
Uttarā.	=	Uttarādhyayanasūtra
Utt. Tī	=	Uttarādhyayanasūtra Tīkā
VM.	-	Visuddhimagga
VS.	=	Vaiśeṣikasūtra
VSU.	=	Vaiśeṣikasūtra Upaskāra
VV.	-	Vyomavatī Vṛtti
VBhā.	-	Viśeṣāvaśyaka Bhāṣya
V. Sū.	-	Vyāsabhāṣya
Y. Sū.	-	Yogasūtra
Yaśo.	-	Yaśomitra
Yoga.	-	Yogasūtra



SYSTEM OF TRANSLITERATION

Vowels

अ	आ	इ	ई	उ	ऊ	ऋ	ए	ऐ	ओ	औ
a	ā	i	ī	u	ū	r̥	e	ai	o	au

Consonants

ক	খ	গ	ঘ	ঢ	চ	ছ	জ	ঝ	ঞ
k	kh	g	gh	ñ	c	ch	j	jh	ñ
ঢ	ঢ	ড	ড	ণ	ত	থ	দ	ঘ	ন
t̥	ṭh	d̥	d̥h	n̥	t	th	d	dh	n
প	ফ	ব	ভ	ম	য	ৰ	ল	ৱ	শ
p	ph	b	bh	m	y	r̥	l	v	ś
ষ	স	হ		:					
s̥	s	h		m̥	h̥				

CHAPTER I

JAINA CONCEPTION OF MATTER

Introduction

A study of the Jaina Āgamas reveals that Metaphysics is something which is correlated with physics, but the metaphysical inquiry goes beyond the scope of physics. According to the Jaina Āgamas, the Universe (*Loka*) is a system of reals, all inter-related with one another with regard to dravya (substance), kṣetra (locus or field), kāla (time) and bhāva (condition or state or mode), having a fundamental unity comprising the plurality of inter-dependent and inter-connected substances. As for example, there are stated to be four aspects of the Universe from the points of view of dravya, kṣetra, kāla and bhāva¹ respectively, i. e. a system of reals is studied with regard to substance, locus or field, time and condition respectively.

The Universe is finite with regard to substance, as it is one in number; it is also finite with regard to locus or field, having the dimension of length and breadth of countless crores of yojanas; it is infinite, permanent, continuous, undecaying, constant, eternal and endless with that to time, for it is Traikālika (i. e. was, is and will be in the past, present and future respectively); there was not, is not and will not be such a time when the existence of the Universe was not, is not and will not be continuous respectively; it is also infinite with regard to condition because the modes of the substances of the Universe, such as, modes of colour, smell, taste and touch, figure, heaviness and lightness, and neither heaviness nor lightness, etc., of pudgala (matter) are infinite.² So the Universe

1. Cauvvihe loe paṇṇatte, tamjahā davvaō, khettaō, kālao, bhāvao—Bhagavatī (Vyākhyāprajñapti) 2. 1. 90.
2. Davvaō nām ege loe sa-aṁte . . . bhāvao nām loe aṇamta vāṇṇapajjavā . . . natthi puna se aṁte.—Ibid.

is eternal, for there is no change in its eternal form from the point of view of its existence and it is regarded as non-eternal in its non-eternal forms from the point of view of modes-decrease and increase, for, if there be a change in one part of the Universe, there occurs a change in the whole of it.

According to Jaina philosophy, Dravya (substance) endowed with guṇa and paryāya (quality and mode or modification) is conceived as Reality. Sat (existence) is the characteristic of Dravya and origination, decay and permanence characterize Reality i.e. Sat-Dravya¹. Dravya² is the crux of Jaina Metaphysics and Physics in particular and a central theme of some Indian

Antavām nI-ie loe dhIro ti pāsai—Sūtrakṛtāṅga, I.1.4 (6); Majjhimanikāya II, Cūlamālumkīyaputta Sutta, 13 for the eternality and non-eternality of the Universe. In this connection see also BhagavatI, 9. 33. 387 ff.; 2. 1. 90 ff. for eternality and non-eternality, finiteness and infiniteness of the Universe.

1. Utpādavyayadhrauvyayuktaṁ sat—Tattvārthādhigama Sūtra, V. 29.; ṣad-dravyalakṣaṇaṁ—Sarvārthasiddhi, V. 29.
2. Nāmasthāpanādravyabhāvatastannyāsaḥ—TS., 1.5.; Davvao ...bhāvao—BhagavatI, 2. 1. 90, Dravyārthikanaya (substantial) and paryāyārthikanaya (mode) point of view; TS. Bhāṣya, V. 31, pp. 399-401; Dravyācāra (external conduct) and Bhāvācāra (internal conduct),; Pañcasaka, 6 ; Dravya-karma and Bhāvakarma (Physical and psychic actions),; Saṭkhandāgama, Vol. 13., p. 43; BhagavatI, 25. 4. 733; TS., V. 37, 39; Saṭkhandāgama, Vol. 3, p. 2; Ibid., Vol. 15, p. 33. Uttarādhyayana, 28. 6 ff. Tattvārtha Rājavārtika, V. 29, 30; Tattvārtha Ślokavārtika, V. 29, 30; TS. V. 37; Sarvārthasiddhi, V. 38; T. Rājavārtika, V. 38; T. Ślokavārtika, V. 38; Saṭkhandāgama, Vol. III, p. 2; Viśesāvaśyakabhāṣya, gāthā, 28; Laghīyastrayam, 1. 2. 7, p. 3; Pramāṇamīmāṃsā, 30, p. 24; Pravacanasāra, Vol. II, p. 123, etc.

systems¹ of thought, in general, while substance (i. e. Dravya) is the pivotal point of philosophy of Spinoza² and Prof. Bertrand Russel.³

Prof. Bertrand Russel defines a substances as "that which can only enter into a proposition as subject, never as predicate or relation. Metaphysically, substances have generally been held to be indestructible."⁴

The Vaiśeṣika⁵ influence is evidently felt on the Jaina conception of Dravya (substance) endowed with guṇa and paryāya (mode),⁶ for like the Vaiśeṣika philosophy the Jaina post-Āgamic work Tattvārthādhigama Sūtra of Umāsvāti defines Dravya as possessing guna and paryāya⁷ instead of Karma (action) of the former. Karma of the Vaiśeṣika is equivalent to paryāya (mode) of Jaina philosophy. Besides, Sattā⁸ (existence or being) is one and the same in both the systems of thought, while it is categorized into six entities in

1. Aṣṭādhyāyī of Pāṇini, Vol. I. 4. 3. 161; Vol. II, 6. 1.79; Vaiśeṣika Sūtra, 1.1.5; 1.1. 15; Mahābhāṣya of Patañjali, 4. I. 3; 5. I. 119; Yogabhaṣya, 3.13.; Slokavārtika, Vanavāda, verses 21-22.; Abhidharmakośa, IX; Ibid., (comm), Yaśomitra; Abh. K. I. 3; Abhidharmaśāpa, p. 90; The Central Conception of Buddhism, p. 22, etc.
2. Spinoza, pp. 31-9, 62-5.
3. Analysis of Matter, p. 236.
4. Ibid, p. 238.
5. Kriyāguṇavat samavāyikāraṇamiti dravyalakṣaṇam—V S., I. 1. 14
6. Guṇaparyāyavad-dravyam—TS., V. 37.
7. Ibid.
8. Sat iti yato dravyaguṇakarmasu sa sattā — VS., 1.2.7; Sattayā sāmānyena sambandhāḥ samavāyarūpo dravya-guṇakarmāṇāṁ sādharmyaṁ — Nyāyakandali, p. 17; Sattā savvapayatthā, savissarūvā aṇāmātapajjāyā Bhāringuppādadhuvattā sapadiivakkhā havadi ekkā — Pañcāstikāyasāra, 8.

both of them, i. e. Śad-dravyas¹ of the Jainas and Śat-padār-thas² of the Vaiśeṣikas.

According to the Vaiśeṣika, Dravya, guṇa³ and karma are different,⁴ whereas Dravya, guṇa and paryāya of Jaina Metaphysics are of one class.⁵ Guṇa inheres in Dravya⁶ and is inseparable from it. It is the capacity, the change of this capacity is paryāya.⁷ Guṇa is potentiality, while paryāya is actuality on the screen of time. They continue with Dravya like earthness or clayness and pitcher.⁸ Guṇas⁹ separable and inseparable from Dravya are paryāya and guṇa proper respectively, for paryāya keeps changing, but guṇa is permanently associated with Dravya;¹⁰ there is no existence of Dravya on the destruction or separation of guṇa.¹¹

According to the Sāṃkhya philosophy, the three guṇas (qualities) Sattva (essence), Rajas (energy) and Tamas (mass or inertia) are the components of Prakṛti¹² which is the stuff.

1. Bhagavati 25.4.733-4; 11.14.4.24; 13.4.4. 82. 3; Anuyoga-dvāra, 324; Gommaṭasāra (Jīva), 560.
2. Dravyaguṇakarmasāmānyaviśeṣasamavāyānāṁ padārthā-nām—Vaiśeṣika Sūtra, 1.1.4.
3. Dravyāṇi dravyāntaramārabhante guṇāśca guṇāntaram—VS., 1.1. 8-9.
4. Dravyaguṇakarmasāmānyaviśeṣasamavāyābhāvāḥ saptapadārthāḥ — Tarkasāmgraha, p. 2;
Artha iti dravyaguṇakarmasu — VS., 8.2.3.
5. Guṇaparyāyavaddravyam — TS., V. 37.
6. Dravyaśrayā nirguṇā guṇāḥ — Ibid, V. 40.
7. Bhāvāntaram sañjñāntaram ca paryāyāḥ —
TS. Bhāṣya, p. 427
8. Ibid, pp. 426-29.
9. Sarvārthasiddhi, p. 510.
10. Ibid, p. 510.
11. Sakalaguṇoparamae punarna taddravyam —
Paramāṇukhaṇḍa Śatṭrimśikā.
12. Triguṇamaviveki Viṣayaḥ, etc.— Sāṃkhya Kārikā, 11.

The Buddhists accept *guṇas* (qualities) instead of the stuff as *dharmaś*¹ (elements); the Jainas admit both the stuff and quality. But Ācārya Saṅkara, the Vedāntin, conceives only the Brahman² as the stuff according to the doctrine of self-alienation (*vivartavāda*). The Buddhists maintain that there is no substratum of *guṇa* and they admit *dharmaś*³ or *guṇas* as the ultimate elements, while the Sāṃkhya accepts Prakṛti as Dravya composed of the aforesaid three *guṇas*. In fact, *guṇas* or *dharmaś* of the Buddhists correspond to the Sāṃkhya *guṇas*—Sattva, Rajas and Tamas.⁴ It can be said that according to Buddhism, Dravya is nothing but *guṇasamudāya* (collection of qualities)⁵ or *guṇasandrāva*⁶ (series of qualities), i. e. sahabhu⁷ or samabhu of *guṇas* (co-existence of qualities); the existence of qualities in succession (*Kramabhu*)⁸ is paryāya (mode).

In the Sāṃkhya view Prakṛti and Puruṣa are beginningless while samabhu—Sattva (essence), Rajas (energy) and Tamas (mass or inertia), Buddhi (intellect), Ahaṃkāra (ego) and Manas (mind) are the paryāyas of Prakṛti in some respect.

1. The Central Conception of Buddhism, p. 9.
Svalakṣaṇadhāraṇād-dharmaḥ — Abhidharma Kośa, I. 3.
2. Atha Brahmajijñāseti — Brahmaśūtra I. 1.
Ekamevādvitīyāṇ — Chāndogya Upaniṣad, VI. 2. 1.
3. Svalakṣaṇadhāraṇād-dharmaḥ — Abh. K., I. 3.
4. The Central Conception of Buddhism, p. 19.
5. Mahābhāṣya, 4.1.3.
6. Guṇasandrāvo dravyamiti — Ibid., 5. 119.
7. Guṇaḥ sahabhāvī, dharmo yathātmani vijñānavyaktiśaktiyādih — Pramāṇanayatattvālokaṇākāra, 7.
8. Paryāyastu kramabhāvī yathā tatraiva sukhaduḥkhādih — Ibid., 8; Guṇa = śakti = sahabhu — natural. Sahabhuśakti is Kāraṇa (cause), while paryāya kramabhuśakti is Kārya (effect).

Jīva and Cetanā¹ (soul and consciousness) are co-existent (Sahabhu), while knowledge is a paryāya of Cetanā² (consciousness) but there is a continuity between them. It is to be observed from the analysis of Saccidānanda Brahman that Sat is Reality, i. e. Dravya of the Jainas, cit and ānanda (consciousness and bliss) are guṇas (qualities). Sat and cit are primary and ānanda is secondary, i. e. general and particular. From the empirical point of view, guṇas, because of being separable and inseparable, correspond thus to paryāya (mode) and guṇa (quality) proper respectively.

The Nyāya-Vaiśeṣika³ admits distinct and separate relation between Dravya and guṇa, while the Sāṃkhya⁴, Jaina⁵ and Mīmāṃsaka⁶ systems of thought accept Kathañcidbheda (somehow distinction or difference) between Dravya and guṇa. The Vedānta Philosophy⁷ maintains non-difference between them. The Jainas call the manifestation of Dravya and guṇa, as paryāya (mode). Śakti (capacity) is intangible, it becomes manifest. Sahabhuśakti (co-existing capacity) is guṇa.

1. The Sāṃkhya guṇas-Sattva (essence), Rajas (energy) and Tamas (inertia) are Anādi (beginningless) and Ananta (infinite). The Jaina guṇas as Śaktis. (capacities) are kāraṇas (causes), while their paryāyas (modes) are kāryas (effects), e. g. Cetanā (consciousness) is guṇa (quality), while Jñāna (knowledge), Darśana (self-awareness), etc. are its paryāyas (modes). Varṇa (colour), etc. as guṇas are causes, while Varṇaparyāyas (modes of colour), etc. are effects. The Jainas used term 'guṇa' like the Sāṃkhya, while the Mīmāṃsaka used the word, Śakti' for guṇa.
2. Ibid.
3. Dravyāṇi dravyāntaramārabhante guṇāśca guṇāntaram —
VS., 1. 1. 10
4. Triguṇamaviveki viṣayaḥ, etc. Sāṃkhya kārikā I
5. Kathañcid-bhedābhedaśvarūpaṁ guṇaparyāyavat —
TS. Bhāṣya Tīkā, pp. 428-9.
6. Ślokavārtika, Vanavāda, vv. 22-23.
7. Ekamevādvitīyaṁ,” Chāndogya Upaniṣad, VI. 2.1.

while Dravya is the transcendental Reality (atīndriya). In the Sāṃkhya philosophy Sattva, Rajas and Tamas, the three components of Prakṛti are unmanifest, while the entities like earth, etc. are manifest. Mūladravya (basic substance) is unmanifest and intangible, e. g. paramāṇu (ultimate atom)¹, while Dravyaparyāya (mode of substance) is manifest. Even among Dravyaparyāyas some are atīndriya (intangible to senses) and some are tangible, e. g. dvyaṇuka (dyad)², tajasa (luminous) and Kārmaṇa (karmic) bodies³ are atīndriya, while other skandhas⁴ (molecules) and effects of Matter are tangible to the senses (indriyagrāhya). So Dravya (substance) of the Jainas is unmanifest and beginningless, the Sāṃkhya Prakṛti also is unmanifest and beginningless. Similarly the Santānas of the Buddhists and the Brahman and Ātman of the Vedānta philosophy are beginningless. An entity becomes manifest only at the present moment with its perception.

The relation of Dravya and guṇa of Jaina Philosophy is further explained in this way that guṇas can never exist independently of Dravya⁵ of which they are the attributes⁶ and one guṇa cannot be the substratum of another guṇa. The Vaiśeṣika school also maintains that guṇa and karma are dravyāśrita⁷ (inherent in substance). That which belongs is dharma (essential character) and that which supports is dharmīn (substratum). In other words, that which is inherent in others is dharma (essential character or attribute). The Vaiśeṣika falls behind Jaina metaphysics in this respect of

1. Bhagavati sūtra. 20. 5. 670; TS. Bhāṣya Tīkā, p. 366.

2. Gaudapāda on Sāṃkhyakārikā, 12.

3. TS., II. 38, 39 and its bhāṣya.

4. TS., Bhāṣya. Tīkā, p. 366.

5. Sakalaguṇoparame punarna dravyam — Paramāṇu khaṇḍa Śatṭrimśikā, p. 3.

6. Dravyāśrayā nirguṇā gunāḥ, TS., V. 40.

7. VS., I. 1. 16 (Dravyāśrayaguṇavān...guṇalakṣaṇam); Praśastapāda's Bhāṣya, p. 38; "Kriyāguṇavat samavāyi-kāraṇamiti dravyalakṣaṇam, VS., I. 1. 15.

the relation between Dravya and guṇa, for Dravya is defined as “Guṇaparyāyavād-dravyam¹” in the latter. In the Sāṃkhya philosophy guṇa is a component of Prakṛti. Dravyāśrita guṇa is dharma (character); there is mention of fifty bhāvas (dispositions²) in the Sāṃkhya Philosophy. Similarly the relation of the Buddhist citta (mind) and its dharma—caitasika (mental) is that citta is one, while caitasikas are many³. It appears from this evidence that the Sāṃkhya influence is evidently felt on Buddhism in this respect. Dharmin (substratum) is manifested by traikālika paryāyas (modes of three points of time—past, present and future), otherwise it becomes inapprehensible to the senses, i. e. the form in which it is apprehensible to the senses at the present time. The gist of the Jaina conception of Reality is that Dravya is endowed with guṇa and paryāya. The inherent qualities in a substance and their traikālika modes are infinite⁴ in number. A substance and its inherent qualities are permanent owing to the cause of its non-origination and non-destruction,⁵ while modes because of their origination and destruction at every moment are invariably non-permanent.⁶ But they are also beginningless and permanent, from the point of view of the series of infinite modes (anāmītā pajjavā),⁷ e. g. the material substance is permanent and its inherent qualities, such as, colour, etc. are also permanent. But the modes of colours, such as, blue, yellow, etc. born of the quality of colour are individually non-permanent because of being subject to origination and destruction and the series of modes of colour, being traikālika, are

1. TS., V. 37

2. Tattvasamāsaśūtra, pp. 282-8.

3. The Central Conception of Buddhism, pp. 85 ff.

4. Bha., 2. 1. 91.

5. Uppattiṭṭva viññāso davvassa ya qatthi atthi sabbhāvo — Pañcāstikāyasāra, 11.

6. Vyayam uppādam dhuvattam karamti tasseva pajjaya — Ibid.

7. Bhs., 2.1. 90; Tattvārtha Śūtra, V. 37.

permanent and eternal.¹ The series of traikālika modes taking place due to one causative capacity inherent in a substance are of the same class. The series of infinite modes caused by infinite capacities in a substance are moving (i. e. continuing) together. The modes of different class caused by various capacities can be found in one substance at a time, but the modes of the same class caused by one capacity at different times cannot be found in one substance at a time.² These take place in the material substance³ into various infinite modes like the modes of colour, such as, blue, yellow, etc.

Matter undergoes transformation by its capacity of colour into various forms of colour, such as, black, etc. The capacity of colour cannot be separated from the material substance and other capacities also which are inherent in it. In matter the series of various modes of colours, such as, blue, etc. are the effects of one causative capacity of colour. There are always taking place in Matter the series of colour, smell, taste, touch, etc. For this reason infinite capacities are cognized by admitting each individual causative capacity of individual series like that of the capacity of colour, that of smell, that of taste, that of touch, etc.

Various modes of capacities, such as, colour, smell, etc. occur in Matter at a time, but different modes, such as, blue, yellow, etc. of one capacity of colour do not take place simultaneously. As material substances are permanent, so their inherent qualities also are permanent, but the modes of the capacity of colour, etc. are not permanent. They, being always subject to origination and destruction, are individually non-permanent and the series of modes of colour in Matter are permanent because of being traikālika.

The undivided whole of infinite qualities only is Dravya (substance). That is to say, the collective whole or aggregate of each individual causative capacity (Kāraṇabhūtaśakti)

1. Tattvārtha Sūtra, V. 37, pp. 229-30.

2. Ibid., p. 206.

3. Bhs., 2. 1. 90.

of each individual mode and of such infinite capacities or qualities is substance from the point of view of difference among them. But Dravya (substance) is called gunaparyāyāt-maka (endowed with quality and mode) from the point of view of non-difference among them because of modes being like their own causative qualities (*Kāraṇabhūtaguṇas*) and qualities being like Dravya (substance). That is to say, Dravya, guṇa and paryāya are different from one another from the subjective point of view in thought, but they are non-different from one another from the objective point of view.¹

In a substance all qualities are not identical; some common qualities are found in all substances, e. g. Astitva (existentiality), Pradeśatva (capacity of having some form), Jñeyatva (knowability), etc. and some are uncommon (i. e. specific) qualities which can be found in each individual substance, e. g. sentiency (*Cetanā*), consciousness (*Upayoga*), etc. in soul and colour (*Rūpa*), etc. in Matter. Each substance is distinct and separate from other substances because of its uncommon quality and modes.²

The Jaina conception of the series of material substances, their qualities and modes is supported by the physical sciences to some extent. It is explained by Prof. Bertrand Russel that "The substitution of space, time for space and time has made it much more natural than formerly to conceive a piece of matter as a group of events. Physics starts, now-a-days, from a four dimensional manifold of events, not, as formerly, from a temporal series of three dimensional manifolds connected with each other by the conception of matter in motion. Instead of a permanent piece of matter, we have now the conception of a 'world line', which is a series of events connected with each other in a certain way. The parts of one light-ray are

1. *Tattvārtha Sūtra*, V. 37.

2. *Ibid.*, p. 208; See also Dravya-Guṇa-Paryāyano Rāsa and. Āgamasāra for the inter-relation of Dravya (substance), guṇa (quality) and paryāya (mode).

connected with each other in a manner which enables us to consider them as forming together one light-ray but we do not conceive a light-ray as a substance moving with the velocity of light. Just the same kind of connection may be held to constitute the unity of an electron. We have a series of events connected together by the causal laws; these may be taken to be electron, since anything further is rash influence which is theoretically useless".¹

As explained, the universal principle of Reality is Dravya (substance), while its particular characteristics are Jīvadravya (sentient principle of living substance) and Ajīvadravya (non-sentient principle or non-living substance).² Jīvadravya is non-corporeal, tasteless, smell-less and indescribable; it is endowed with sentiency, it is soundless, non-apprehensible by a mark; and it is of indefinite shape (anirdiṣṭasāmsthāna).³

The common characteristics of Jīvadravya are that it is devoid of five colours, five tastes, two smells and eight touches, i. e. non-material; it is subtle and non-corporeal, neither heavy nor light; it is endowed with countless points and indefinite figure;⁴ while its uncommon characteristics are that it is the enjoyer and self-manifesting and manifester of others.⁵ Ajīvadravya⁶ is explained by making division of it into five cate-

1. Analysis of Matter, pp. 244-45.

2. Duvihā davvā pi tam jīvadavvā ya ajivadavvā ya — Bhs., 25. 2. 720; Avisesie davve visesie jīvadavve ajīvadavve ya — Anuyogadvāra sūtra, 123; Jīvabhigama Sūtra, 1st chapter; Uttarādhyayana Sūtra, 36. 2; Saṅkhaṇḍāgama, Vol. III, p. 2; TS., V. 1-3; Pravacanasāra, 35, p. 178; Dravyasāmagraha, 23; Gommaṭasāra, 562,

3. Saṅkhaṇḍāgama, Vol. III. p. 2.

4. Ibid., p. 1.

5. Uddhagaṭ bhottā saparapagāsao ttijīvassa asāhāraṇālak-khaṇām, Ibid.

6. Bhs., 25. 2. 720; 7. 10. 307; Sthānāṅga 4.1.251; Ajīvakāyā dharmādharmākāśa-pudgalāḥ — TS., V. 1; —Dravyāni Ibid., V. 2.

gories, viz. Dharmāstikāya (principle of motion), Adharmāstikāya (principle of rest), Ākāśastikāya (space), Pudgalāstikāya (matter) and Addhāsamaya or Kāla¹ (time). These Ajīvadravyas are classified into two groups, viz., Rūplajivadravyas (corporeal non-living substances which are both tangible and intangible to the senses) and Arūplajivadravyas (non-corporeal, non-living substances which are intangible to the senses).² Pudgala is a corporeal non-living substance.³ So non-corporeal, non-living substance, consists of Dharmāstikāya, Adharmāstikāya, Ākāśastikāya and Addhāsamaya or Kāla.⁴

A study of other Indian systems of thought except the extreme views of monistic materialism of the Cārvākas and monistic spiritualism of the Vedānta reveals also that there are two aspects of Reality (Satvastu), viz. Cetanatattva (sentient principle) and Acetanatattva (non-sentient principle). In the Sāṃkhya-Yoga Puruṣa and Prakṛti are Cetanatattva and Acetanatattva respectively as the two aspects of Reality.⁵ According to the Nyāya-Vaiśeṣika system of thought, only Ātmā (soul-substance) among the nine categories of Dravya (substance) is Cetanatattva like Jīva (soul) of Jaina philosophy. The difference between them is this that the reflection (Chāyā) of Jadatattva (non-sentient principle) does not fall (i. e. affect) on the soul-substance of the Nyāya-Vaiśeṣika school, whereas it falls on the soul-substance of Jaina metaphysics. Other eight substances, viz. earth, water, fire, air, ether (ākāśa), direction (dik), time and mind are the non-sentient

1. Bhs., 25. 2. 720; Dravyasaṅgraha, 15, p. 44;
Gommatasāra, 563, p. 209 (Jīvakāṇḍa)
2. Bhs., 25. 2. 720; Jīvābhigama, 3, p. 105; Paññavānā, 2, p. 265; Anuyogadvāra, 142; Śatkhandāgama, Vol. III. p. 2
3. Bhs. 7.10 305; Sthānāṅga, 5.4.3 Rupināḥ pudgalāḥ TS.. V. 4.
4. Ibid., See also Gommatasāra, 563 (Jīvakāṇḍa), p. 209.
5. Sāṃkhyadarśana, 15, 18; Sāṃkhya kārikā, Īśvarakṛṣṇa III.

principle of the Nyāya-Vaiśeṣika philosophy.¹ The Mīmāṃsā² admits the existence of Cetanatattva (the self) and Acetanatattva (non-sentient principle) like the Nyāya-Vaiśeṣika system of thought.

According to the Buddhist philosophy, Nāma or Citta (mind) and Rūpa (matter) represent Cetanatattva and Acetanatattva³ respectively. Nāma or Citta includes the four mental elements, viz. Vedanā (feelings), saṃjñā (ideas), saṃskāras (volition and other faculties) and vijñāna (pure sensation or general consciousness), while Rūpa represents the elements of Matter, the physical elements of a personality (Pudgala) including its outer world—the external objects.

The Vedānta system of thought⁴ accepts the Absolute Brahman and Jagat (the Universe) as Cetanatattva and Acetanatattva respectively, although it regards Jagat to be the effect of the Brahman (Universal self), produced by its Māyāśakti (power of illusion) which is also called Prakṛti⁵, as Nāma (name) and Rūpa (form).

1. Pṛthivyāpastējo vāyurākāśam kālo digātmā mana iti dravyāṇi — VS., I. I. 5; Tatra dravyāṇi pṛthivyāpastējo ... navaiveti — Praśastapādabhāṣya, p. 3.
2. Prakaraṇa Pañcikā, p. 52, etc. and Prabhākara Mīmāṃsā, p. 35, etc., vide History of Indian Philosophy, Vol I, p. 378.
3. The Central Conception of Buddhism, pp. 5-6; The Basic Conception of Buddhism, pp. 87-88, F. Note No. 41, 42.
4. Atha Brahmajīvāseti — Brahmasūtra, 1.1. 10; Janmādyasya yataḥ — Ibid., I. I. 2.
5. Chandāmsi yajñāḥ kṛtave vratāni
bhūtam bhavyam yacca vedā vadanti
Asmānmāyī sṛjate viśvametat—
tasmiṁścānyo māyayā saṃniruddhaḥ.

—Śvetāśvatara Upaniṣad, 4. 9;

Māyām tu prakṛtiṁ vidyānmāyinām tu maheśvarām
Tasyāvayavabhbūtaistu vyāptam sarvamidam jagat.

—Ibid., 4.10.)

The Rāmānuja School of Vedānta also advocates the doctrine of Cit and Acit¹ as the central theme of studies, i. e. the sentient and non-sentient principles. According to the Cārvākas, "everything else including consciousness and other psychic phenomena, indeed, the whole paraphernalia of the so-called spiritual life is a function of matter."²

In a nutshell it can be said that there are two traditions of these principles—Ātmā tradition and Ātom-tradition which manifest themselves as Cetanatattva and Acetanatattva in infinite forms and manners with their respective characteristics in the Universe. In Western metaphysics also this 'Dualism of Matter and Spirit' is explained in this way that "Each atom of the nebula...must have had an aboriginal atom of consciousness linked with it; and just as the material atoms have formed bodies and brains by massing themselves together, so the mental atoms, by an analogous process of aggregation, have fused into those larger consciousness."³

The emergence of the thought on Cetanatattva (sentient principle) can be traced back to Bhūtacaitanyavāda (doctrine of consciousness born out of material elements), Svatantrajīvavāda (doctrine of independent soul), Svatantra and Parāśrita Jīvavāda (doctrine of independent and dependent soul).⁴

1. Śrībhāṣya, Rāmānuja, I. I. 43.

2. The Conception of Matter According to Nyāya-Vaiśeṣika, p. x.

3. The Principle of Psychology, p. 147.

4. Bhāratīyatattvavidyā, p. 75; Kālaḥ svabhāvo niyatiryadṛcchā bhūtāni yonih purusa iti cintyam, Śvetāśvataro Upaniṣad—1. 2; Idam mahadbhūtamanantamapāram vijñānaghana evaitebhyo bhūtebhyah samutthāya tānyevānuvināśyati na pretya saṁjñāsti — Bṛhadāraṇyaka Upaniṣad, 2.4.12; — Vīro davvam khettam mahesena vanam pamāṇo kāla ya Bhāvo u bhāvapuriso samāsayo niggamamgām;

Viśeṣāvaśyakabhbāṣya, gāthā, 1553; —

Virakta...Caitanyakhatitkāyānnātmā anyo astīti manyate—Nyāyamañjarī, pt. II, p. 3;

But in opposition to the view of Bhūtacaitanyavāda, the thoughts on the doctrine of rebirth, after-life and the doctrine of independent soul went on vigorously with the development of Indian Philosophy. It is not known who started this movement of this doctrine, when and where, but it is definite that there were many sects of the leaders, following this doctrine and they made speculation about it in their respective manners.¹

Acetanatattva (non-sentient principle) also can be traced back to Bhūtavāda (doctrine of material elements)² which arose out of the thought on the object of the senses, i. e. the objects apprehended by the senses. The starting of the search for this Acetanatattva took place with the thought on the objects experienced by the senses. It is known that some thinkers, having kept the perceptible world in view, which came

Pāñca khaṇḍhe vayaṁtege bālā u khaṇa joīṇo
anno ananno nevāhu heuyaṁ ca āheuyaṁ;

—Sūtrakṛtāṅga, I. I. 17;

Pudhavī āyu teu ya, tahā vāyū ya egao

Cattāri dhāuṇo rūvam̄ avamāhaṁsu āvare — Ibid., I.I.18;

Cātumahābhūtika ayaṁ puriso yadā kālaṁ karoti—Dīghanikāya, Sāmaññaphalaśutta, Ajitakeśakambalavāda (3) 22;

Iti paṭhame purisajāe tajjīvatāccharīra tti āhie

Docce purisajāe pāñcamahābhūie tti āhie—Sūtrakṛtāṅga, 2

Ponḍarīya ākhyānavāda ; Sūtrakṛtāṅga's Niruykti (i)

gāthā, 30 and Gaṇadharavāda, p. 50 ;

Pṛthivyāpatejo vāyuriti tattvāni

tatsamudāye śarīrendriya viśayasamjñā —

Tattvopaplavasiṁha, p. 1; Tebhyaścaitanyamiti. tatra-

kecidvṛttikārā vyācakṣate utpadyate tebhyaścaitanyam̄,

anye abhivyajyata ityāhuḥ—Tattvasaṅgrahapañjikā, p. 205;

Taṁ jīvaṁ taṁ sarīram — Majjhimanikāya II, Cūlamā-

lunikīya sutta ; Yathā guḍapiṣṭādayaḥ ... caitanyam̄

saprakṣayanti — Nyāyamañjarī, II, p. 3.

1. Bhāratiyatattvavidyā, p. 78.

2. Svetāśvatara Upaniṣad, 1. 2.

first of all in thought, accepted the nature of the world as endowed with the five elements (pañcabhūtas¹ or pañcadhātus² or pañcaskandhas).³ On the basis of this postulation other thinkers began to make a clarification of the nature of Acetanatattva of Ajīvadravya.

As to the essential nature of six categories of Dravya (i. e. Reality) as determined by the two divisions of Dravya—Jīvadravya and Ajīvadravya in the Jaina Āgamas and the post-Āgamic works, it is explained that the five extensive substances, viz. Dharma (principle of motion), Adharma (principle of rest), Ākāśa (space), Jīva (soul), Pudgala (matter) and Kāla (time) the sixth substance, are permanent in their nature and fixed in number as the sole constituents of the universe; and all except pudgala are non-corporeal.⁴

Ācārya Kundakunda explains that the five extended reals manifest themselves in various forms through their numerous qualities and modifications and fill the three worlds.⁵ In other words, they are the constituents of the cosmic universe. They maintain their permanence through the manifestation of their various qualities and modifications and constitute the substance, i. e. Reality, together with time which is endowed with the quality of permanence-in-change.⁶ That is to say, "these five reals are being and becoming. They maintain

1. Svetāśvatara Upaniṣad, 1.2.

2. Dīghanikāya, Sāmaññaphala Sutta, see the view of Ajitakeśakambalī.

3. Snatrakṛtāṅga, I. I. 17.

4. Pañcaṭhikāe na kayāi nāś na kayāi natthi, na kayāi na bhavissai bhuviṁ ca bhavai ya bhavissai ya dhuve niyae sāsae akkhae avvae avaṭṭhie nicce arūpī — Nandi-sūtra, 58; Poggalathikāyam rūvikāyam — Bhs., 7. 10. 305; TS., V. 4; PS., 22.

5. Jesim atthisahāo gunehim saha pajjaehim vivihehim Je horīti atthikāyā nippaññam jehim tellokkam — PS., 5.

6. Te ceva atthikāyā tekkaliyabhāvapariṇādā nīcā Gacchāmīti daviyabhāvam pariyatṭaṇalimgasamjuttā, Ibid., 6

their identity in the midst of their changes and thus are characterized by three factors, viz. origination, decay and permanence in the process of birth and destruction.”¹ As time also possesses these three qualities so there are stated to be six fundamental substances. Ācārya Pūjyapāda, while commenting on the aphorism “Nityāvasthitānyarūpāṇī”, explains that the six substances, viz. Dharma (principle of motion), Adharma (principle of rest), Ākāśa (space), Jīva (soul), Pudgala (matter) and Kāla (time) are eternal and unchanging in their characteristics and except Matter all are devoid of form (i. e. non-corporeal); Dharma cannot become Adharma or Jīva cannot become Ajīva (non-soul). The number of Dravyas (substances) is fixed as six; it can never be seven or five and with the exception of Pudgaladravya (material substance), the other five Dravyas are non-material and non-corporeal, hence devoid of all characteristics of Pudgala, such as, colour, taste, smell and touch, etc.² Therefore, according to Jaina metaphysics, there are stated to be six categories of Reality called Sarvadrvyas in the universe, i. e. positive fundamental reals characterized by qualities and modes, viz. principles of Motion and Rest, Space, Soul, Matter and Time.³

It is to be noted that in No. 2 aphorism of the fifth chapter of the Tattvārthaśāhigama Sūtra containing the Śvetāmbara tradition the word “Dravyāṇī” (substances) has been joined together with the word ‘Jīvāśca (souls) to form this aphorism “Dravyāṇī Jīvāśca”. That is to say, Dharma and Adharma, Ākāśa, Pudgala and Jīva are the five fundamental extensive substances,⁴ and Kāla is not included here.

1. PS., 6. (comm).

2. Sarvārthaśiddhi, pp. 270-71.

3. Chavvihā savvadavvā pa. tamjahā-dhammatthikāe adhammatthikāe jāva addhāsamaye—Bhs., 25. 4. 733-4 ; 11. 4. 424; 13. 4. 482-3; Anuyogadvāra sūtra, 324 and Gommaṭasāra (Jīvakāṇḍa), 560.

4. Ete dharāmādayaścatvāro jīvāśca pañca dravyāṇī ca bhavanti — TS. Bhāṣya, p. 320.

The Digambara tradition as preserved in the Sarvārthasiddhi, the Tattvārtha Rājavārtika and the Tattvārtha Ślokavārtika avers that their No. 2 aphorism, ch. V., "Dravyāṇī" conveys the meaning that principles of Motion and Rest, Space and Matter are the substances (Dharmādharmākāśa pudgalāḥ dravyāṇī). According to this view, the aphorisms No. 3 and No. 39, ch. V, includes Souls and Time (Jīvāśca and Kālaśca) respectively in the categories of Reality as conceived in Jaina philosophy. As to the conception of six fundamental substances there is no difference between the two versions which are preserved in the Tattvārthādhigama Sūtra and in the Sarvārthasiddhi, the Tattvārtha Rājavārtika and the Tattvārtha Ślokavārtika respectively, but only the formation of the Sūtras differs.

The Nyāya-Vaiśeṣika system of thought advocates the doctrine that there are stated to be nine substances (Dravyas), i. e. constituent elements of the Universe, viz. earth (pr̥thivī), water (ap), fire (teja), air (vāyu), ether (ākāśa), time (kāla), direction or relative position (dik or diśā), soul (ātmā), and mind (manas).¹ Earth, water, fire, air and mind are incorporated into the category of pudgaladravya (material substance) of Jaina metaphysics. "These are characterized by colour, taste, smell and touch as the sense of sight".² It is to be observed here that all these four qualities are inherent in all kinds of Matter—tangible and intangible to the senses and may or may not be apprehended by the physical senses simultaneously, and none of them are associated with other substances of the cosmic Universe.

The Vaiśeṣika school holds the view that air is devoid of

1. Pr̥thivyāpastējo vāyurākāśakālo digātmā mana iti dravyāṇī —VS., 1.1.4; PP Bhā., p. 3; Tarkasāmgraha, 2, p. 5.
2. Pr̥thivyāptejo vāyumanāṁsi pudgaladravye antarbhavanti; rūparasagandhasparśavattvāt —Sarvārthasiddhi, p. 268; Pr̥thivyāptejo vāyumanāṁsi tāvat pudgaladravyameva mūrtakriyāvattvād-ātmapariṇāmitā vā vasudhādayaḥ pudgalā jīvā eva manusyādīvat — TS. Bhā. Tīkā, p. 321.

form.¹ Ācārya Pūjyapāda explains the point by refuting this view in the following manner : "It is not true to say that air and mind do not possess colour, taste, etc. Indeed air possesses colour and so on, as it touches like the pitcher and so on. If it is said that colour, taste and smell are absent in air because these are not perceived by the sense of sight, then it would lead to the negation of atoms also. Water is characterized by smell, as it possesses touch like earth. Similarly, mind also is of two kinds-physical mind and psychical mind. Therein the psychical mind is knowledge. And knowledge is the attribute of Soul. So it comes under Soul. As the physical mind is characterized by colour, taste, smell and touch, it is a modification of matter. The physical mind is characterized by colour, taste, smell and touch, for it is the cause of knowledge like the sense of sight."²

"It is contended that we do not see the air and mind producing the effect (Kāryatvam) of colour, taste, etc., as we do in the case of atoms. We say that such an effect can be admitted that all atoms can produce effects containing (all) colours, tastes, smells, etc. There are no atoms of the class of earth, water, fire or air. For all activity proceeds with the intermixture of blending of classes."³ According to the theory of science, air can be converted into a "bluish liquid by continuous cooling just as steam can be converted into water."⁴ This scientific experiment demonstrates that air is endowed with the quality of colour and is therefore incorporated into the category of matter.

The Nyāya-Vaiśeṣika system of thought propounds the theory that fire is endowed with the quality of touch and colour⁵ only, but it is devoid of taste and smell, while air possesses

1. Sparśavān vāyuḥ — VS., II. 1.4; Tarkasamgraha, 12.

2. Sarvārthaśiddhi, pp. 268-9; Reality, p. 131.

3. Ibid., p. 269 ; Reality, 131.

4. Cosmology, Old and New, p. 78.

5. Tejo rūpasparśavat — VS. II. 1, 3; Tarkasamgraha, 11, 19.

only the quality of touch.¹

According to Jaina philosophy, air possesses not only colour and touch but also taste and smell. Modern science has clearly proved that it is a material substance, for when the energy (heat) of molecular agitation is very great, its temperature rises creating the sensation of fire. It is a form of energy which is a modification of matter, for energy is the attenuated form of matter and matter is a bottled energy. So they are identical. The qualities of matter are associated with fire, as it is demonstrated that "the flame consists of incandescent matter, raised to a high temperature by the process of combustion and that flame can exist only so long as the combustion goes on and a sufficiently high temperature is thereby maintained to render the burning matter luminous. The flame is the outward visible sign of certain chemical and physical process, of action and reaction between the material which is being burnt and the atmosphere which surrounds it."²

The Jaina Āgama, the Bhagavatī Vyākhyāprajñapti throws a side light upon this theory of fire by making a similar scientific analysis of the burning of fire in a lamp in connection with the holy teachings of Mahāvīra in this way : A lamp, its stand, wick, oil and cover do not burn, but fire in the wick burns.³ It is the well-known theory that the oil of the lamp is sucked by the capillary action caused by the heat of fire burning at the tip of the wick. Therefore, fire is included in the category of Pudgaladravya (material substance).

According to the Nyāya-Vaiśeṣika school, earth possesses

1. Tarkasāṅgraha, 13, p. 9; VS., II. 2. 4;
Muktāvalī, 42.
2. Outlines of Evolutionary Biology, p. 2; Cosmology, Old and New, p. 79, foot note.
3. Na padīve jhiyāi na latthi jhiyāi na vatti jhiyāi na tele jhiyāi, etc. Bhs., 9. 6. 333.

the natural quality of smell¹ together with colour, taste and touch. It is regarded by this system of thought that smell is existent only in earth, its presence in other substances like water, fire and air is not natural, but is "due to the mixture of the earthly particles with them."² Although odour is existent in them, it cannot be apprehended by the sense-organ of smell, i. e. the nose. For "Human nose is not sensitive enough to detect the smell of these. Several cases are known where our olfactory organ fails, for instance, the cat at once smells the milk or a hound smells the chase."³

Modern science has classified Matter into three states, viz. solid, liquid and gaseous states. Jaina metaphysics holds that Matter (pudgala) exists in the space of the Universe in the forms of earth (pr̥thivī), water (jalaṁ), air (vāyu), etc.⁴ That is to say, they connote solid, liquid and gaseous states respectively and thus naturally come under the category of pudgala (matter).

In the Nyāya-Vaiśeṣika school Ākāśa (ether)⁵ is regarded as a material substance (bhautika dravya); it is endowed with all pervasiveness and it is a fundamental principle of creation. Besides, it is the pure space having the property of accommodation to give room to other substances. The Jaina systems of thought also maintains the view that Ākāśa is an eternal,

1. Rūparasagandhasparśavatī pr̥thivī, VS. II, 1. 1; Lakṣaṇāvalī of Udayana, p. 18; Vyavasthitāḥ pr̥thivyām gandhaḥ—VS. II, 2.3.
2. The Conception of Matter According to the Nyāya-Vaiśeṣika, p. 317.
3. Cosmology, Old and New, p. 78.
4. Sūtrakṛtāṅga 1. 1. 17; Sarvārthaśiddhi, p. 268; TS. Bhā. Tīkā, p. 321.
5. Ākāśakālādigātmānāṁ sarvagatatvāṁ paramamahattvāṁ sarvasaṁyogisamānadeśatvāṁ ca—Bhā., p. 8; Pariśeṣālliṅgamākāśasya—VS., II. 1. 27.

infinite substance with accommodation (*avagāhana*)¹ as its property, giving room to other five fundamental substances, viz. Dharma, Adharma, Jīva, Pudgala and Kāla. The reality of Ākāśa has also been accepted by all other Indian systems of thought like the Sāṃkhya², Theravāda Buddhism,³ the Vaibhāṣika⁴ and the Vedānta⁵ as the substratum of all other four elements (*bhūtas*), viz. earth, water, fire and air.

As regards Dik (direction) of the Nyāya-Vaiśeṣika system of thought it is conceived "as that from which the notions of the various directions are produced with reference to a particular finite (*mūrta*) object as the basis of our judgement."⁶

The Jaina conception of Ākāśa (space) includes Dik⁷ in its category, i. e. it is interpreted as mathematically pure space. "The convention of east, west, etc. in the series of rows of the points of space is based on the rise of the sun, etc.

1. Guṇao avagāhaṇāguṇe—Bhs., 2.10. 118.;
Avagāhaṇālakkhaṇe naṁ āgasaṭṭhikāe, Ibid., 13. 4. 48!.;
Uttarādhyayana Sūtra, 28. 9.; TS., V. 18.
2. Vāyorāvaraṇam yadi hi avakāśarūpaṁkāśam na syāt tadaṁ mūrtadravyeṣu sthālyādiṣu antasteja ādipraveṣo na syāt—Yogavārtika, pāda III;
3. Abhidharmadīpa, p. 9 (Ākāśa-dhātu).
4. Anāsravā mārgasatyaṁ trividham cāpyasaṁskṛtam
Ākāśam dvau nirodhau ca tatrākāśamanāvṛtiḥ — Abh.
K. i. kā.5; Avakāśam dadātītyākāśamiti nirvacanam
bhṛśamasyāntah kāśante bhāvā ityākāśamityapare — Abh.
K. I. Kā. 5, Sphuṭārtha.
5. Ākāśastallingāt, Brahmasūtra, 1. 1. 22.;
Āsamantāt kāśata iti Ākāśaḥ-Śrīnivāsa, Vedānta-Kaustubha
6. PPBha., p. 28; The Conception of Matter According to Nyāya-Vaiśeṣika, p. 189.
7. Diśo'pyākāśe antarbhāvah—Sarvārthasiddhi, p. 269.
Diśaścākāśānna dravyāntaram...diśāmasti, TS. Bhā,
Tīkā, p. 321.

For instance, this direction is here (The east is in the direction of sunrise).¹

Ātmā (soul) and Kāla (time) are common to both the systems of thought—Jaina and Nyāya-Vaiśeṣika. Thus, the nine categories of Dravya (substance) of the Nyāya-Vaiśeṣika school can be reduced to the six categories of Dravya of Jaina philosophy.

Of the six categories of Dravya (i. e. Reality) as conceived in this system, Dharmāstikāya, Adharmāstikāya and Ākāśastikāya, among the non-living substances (ajīvadravyas) are one continuum each, i. e. indivisible wholes or single substances.² Besides, they are immobile or without activity.³ According to Ācārya Pūjyapāda, Kāla (time) also has no capability of movement.⁴ He has raised the question here : “If Dravyas—Dharma, Adharma, etc. are not capable of movement from place to place, their utpāda (origination) should not take place; consequently there will be the negation of vyaya (decay) due to the negation of origination.”⁵ It is clearly explained in connection with the conception of Dravya—Sat (Reality) and its nature that it is characterized by origination, decay and permanence.⁶ That is to say, origination and decay must take place in the six fundamental substances in some form or other. Ācārya Pūjyapāda himself solves the problem by explaining it in the following manner.” By the authority of the scriptures infinite ‘agurulaghugunas (qualities of neither heaviness nor lightness), which maintain individuality of substances, are

1. Sarvārthaśiddhi, p. 269.
2. Dhammo ‘adhammo āgāsam davvam ikkikkamāhiyam
anāmītam ya davvāni, kālo puggalajāmītavo
—Uttarādhyayana Sūtra, 28.8;
Ākāśādekadraavyāni—TS., V. 5.
3. Niśkriyāni ca, TS., V. 6.
4. Sarvārthaśiddhi, p. 274.
5. Ibid., p. 273.
6. Utpādavyayadhrauvyayuktam sat, TS., V. 29.

admitted. These undergo six different steps of rhythmic rise and fall (increase and decrease). Origination and decay are established by these changes".¹

It means that "Among the six common attributes, viz. astitva (existentiality), vastutva (functionality), dravyatva (changeability) prameyatva (capacity of being the subject of knowledge), agurulaghutva (individuality or neither heaviness nor lightness) and pradeśatva (capacity of having some form), agurulaghuguṇa is such that an imperceptible rhythmic rise and fall is constantly taking place in its parts in six different steps and these natural rhythms-rising and decaying produce utpāda and vyaya. Agurulaghu attribute is said to be responsible for maintaining the individuality of a substance and its characteristic properties".²

So six fundamental substances, viz. Dharmāstikāya, Adharmāstikāya, Ākāśastikāya, Jīvāstikāya, Pudgāstikāya, and Addhāsamaya or Kāla, have been conceived by the Jaina thinkers as six categories of Reality through their experience and critical analysis of the noumenal and phenomenal aspects of it, and of eternal sentient principle (Jīvatattva) and non-sentient principle (Ajīvatattva) of the existing Universe. This conception of Reality with its nature reveals that prāṇitattva (principle of beings) and Jaṭatattva (principle of non-being) come into being and are becoming. In this way they avoided the question of creation and beginning. These six categories of Reality are characterized by the three potent factors, viz. origination, decay and permanence. They are not Kūṭasthanitya tattvas (absolutely unchangeable reals) like those of the Sāṃkhya and Vedānta schools of thought., i. e. Puruṣa and Brahman respectively. They are eternal, independent and permanent reals from the point of view of substance (Dravya), yet they are

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1. Anantānāmagurulaghuguṇānāmāgamapramāṇyādabhyupagamyamānānām satsthāpanapaititayā vṛdhyā hānyā ca pravartamānānām svabhāvādetesāmutpādo vyayaśca— Sarvārthaśiddhi, p. 273.
 2. Cosmology, Old and New, p. 100.

also changing in nature from the modal point of view, as they are conceived from the aspects of their infinite guṇas (qualities) and paryāyas (modes). There are infinite living and non-living substances possessing infinite guṇas and infinite paryāyas.¹

In the midst of the series of eternal and infinite changes taking place in the aforesaid six substances they persist as Pariṇāmītya Dravyas (permanent-in-change substances).

Concept of Matter (Pudgala) :

Matter has been studied by every system of Indian philosophy in its own manner. Bhūta of the Cārvākas,² Prakṛti³ of the Sāṃkhya-Yoga, Jāḍadravya⁴ of the Nyāya-Vaiśeṣika⁵ and the Mīmāṃsakas,⁶ Rūpa⁷ of the Buddhists, Māyā⁸ of the Śāṅkara-Vedānta, Acit⁹ of the Rāmānuja-Vedānta and Pudgala¹⁰ of Jaina philosophy are only diverse views on this problem.

The concept of Matter can be traced back to Bhūtavāda¹¹ (doctrine of elements of Matter) which arose out of the Indian speculative thought on the objects of the sense in the Upaniṣadic period. As pointed out, on the basis of the postulation of the nature of the world as endowed with five elements (pañca-bhūtas¹² or pañcadhātus¹³ or pañcaskandhas)¹⁴ some thinkers

1. Bhs, 25. 2. 720.

2. Tattvopaplavasiṁha, p. 1.

3. Sāṃkhyakārikā, VV. 8, 10, 11.

4. Vaiśeṣika Sūtra, 1. 1. 5.

5. Praśastapādabhāṣya, p. 16; Nyāyakandali, p. 16.

6. Prabhākara Mīmāṃsā, pp. 35 ff.

7. Abhidharmakośa, 1. 24.

8. Kacinmāyeti sūcitaṁ māyāṁ tu prakṛtiṁ vidyānmāyinantu
maheśvaramiti mantravarṇat — Śāṅkarabhāṣya on
Brahmasūtra, 1. 43.

9. Śrībhāṣya, 1. 43. 10. Bhagavati Sūtra, 2. 10. 118.

11. Śvetāśvatara Upaniṣad, 1. 2. 12. Ibid.

13. Dīghanikāya, Sāmaññaphalasutta, the view of Ajitakeśa-
kambali.

14. Sūtrakṛtāṅga, 1. 1. 17-18

began to clarify the nature of the non-sentient principle (Acaitānatattva or Ajīvatattva) the most visible form of which is Matter.

Kṣiti (earth), ap (water), tejas (fire), vāyu (air) and ākāśa (ether) are called the five elements of Matter (pañcabhūtas)¹. They are also known as five aggregates of matter (pañcaskandhas)². The words 'dhātu'³ and 'kāya'⁴ also are used in this sense. Later on, the word 'dravya,'⁵ was employed for this 'bhūta' indicating the elements of matter. There is no difference of opinion in regard to earth, water, fire and air—the four entities, as being tangible to the senses. Ākāśa⁶ was accepted unanimously by some Indian schools of thought as the container of these four elements. In this sense of realities the word 'bhūta' was used by the ancient Indian thinkers that these entities which exist by themselves are also real.

Just as some tree stands on the base of its trunk, just so the structure of the material universe is standing on the foundation of these aforesaid five elements. Therefore, these elements—earth, etc., are called 'Skandhas.'⁷

The meaning of 'dhātu' is explained in this way : that which maintains and nourishes the universe is called 'dhātu', just as vāta (air), pitta (bile) and kaph (phlegm)⁸ are called

1. Śvetāśvatara Upaniṣad, 1. 2.

2. Sūtrakṛtāṅga, 1. 1. 17-18.

3. Abhidharmakośa, 1. 20. It seems that "Dhātu has been borrowed from medical science where it means elements of body".

4. Bhagavatī Sūtra, 33. 1. 844 Puḍhavikāya, apkāya, etc.

5. Vaiśeṣika Sūtra, 1. 1. 5.

6. Ākāśa has been accepted as space-container of all others substances by the Jainas (Tattvārtha Rājavārtika, p. 434) and the Vaibhāśikas respectively (Abhidharmakośa, K. 1, Karikā 5, Sphuṭārthā).

7. Abhidharmakośa, Commentary on K. 1. 2.

8. Carakasāṃhitā, Śarīrasthāna.

'dhātu' because of their being the maintainer and nourisher of the human body. The meaning of the word 'kāya' is the organic body or figure in the Indian literature. The five entities—earth, etc. are called 'kāyas'¹ (bodies) because of their being of different shapes or figures. These entities are called 'dravyas'² (substances) on account of the continuity of their various tangible qualities and actions or modes in the womb of space and time. Similarly, such a doctrine that the universe is composed of five elements (*pāñcabhautika*) has emerged with the development of Indian metaphysical thought. A reference to these five elements (*bhūtas*)³, earth, water, fire, air and ākāśa is found in the *Upaniṣads*,⁴ the Buddhist *Piṭakas*⁵ and the Jaina Āgamas.⁶ But the Indian speculation about Acetanatattva (non-sentient principle) went on more and more and it turned towards the subtle cause from the tangible gross cause of the material universe. The group of advocates of the concept of five elements of matter fell apart from that of the speculators of the finest cause of Acetanatattva. The first group of thinkers stopped there and began to establish the concept that there was nothing else except the five elements of matter (*bhūtas*). This concept is known by the name of Bārhaspatya, Lokāyata or Cārvāka.⁷

One tradition of Indian schools of thought accepting the concept of four elements of matter (*bhūtas*)⁸ without ākāśa (ether or sky) was also continuing in the field of metaphysical

1. Bhagavati sūtra, 24. 16. 702-709.

2. Pṛthivyāpastejo vāyurākāśam iti dravyam, —. VS. 1. 1. 4.

3. Nyāyamañjarī, Pt. II.

4. Śvetāśvatara Upaniṣad, 1. 2.

5. Dīghanikāya, Sāmaññaphalasutta; see the view of Ajitakeśakambalī.

6. Sūtrakṛtāṅga, 1. 1. 17.

7. Dīghanikāya, Sāmaññaphalasutta;
Tattvopaplavasiṁha, p. 1.

8. Ibid, p. 1.

speculation of non-sentient principle in course of time. On the other side those Indian thinkers who were not satisfied with the concept of the five elements of matter apprehended by the senses began to speculate about the cause of these reals and their nature. In this way two currents of thought on the problem of non-sentient principle arose in the field of Indian metaphysics, giving birth to the concepts of Matter. One group of Indian thinkers started to find out the fundamental cause out of the material realities on the basis of inner feeling and thought, while the other group began to think over the nature of the fundamental cause mainly on the basis of the sense-experience. The Sāṃkhya and Brahmanavādina views on it represent the first current of thought and Nyāya-Vaiśeṣika, Buddhist and Jaina views on this problem represent the second one.

According to Jaina metaphysics, the most visible form of Ajīvadravya (non-living substance) or Acetanatattva is Pudgalastikāya (matter) which exists in the Universe in various forms, such as, earth, water, fire, air, shadow, objects of four senses—hearing, smell, taste and touch, physical mind, speech, bodies, etc. up to karmic matter and paramāṇu¹ (ultimate atom). Pudgala is a tangible reality within the sensuous and supersensuous experiences in perceptible and imperceptible conditions. Its finest form is paramāṇu (ultimate atom). The concept of Pudgala preserved in the Jaina Āgamas forms the basis of the physical sciences in Jainism in a nascent form. On it a superstructure of analysis of Pudgala has been raised by Umāsvāti and other Jainācāryas in post-āgamic period and darśanakāla (age of Indian philosophy) with a synthetic view of all other Indian concepts of Matter on the basis of its existence in the Universe as a permanent substance endowed with infinite qualities (guṇas) and modes (paryāyas)² which

1. Puḍhavi-jala-chāyā-cauriṇḍiyavisaya-kamma-khaṇḍha-paramāṇu—Saṭkhaṇḍāgama, Vol. III, p. 3;

Pañcāstikāyasamayasāra, 83, p. 81; Gommaṭasāra, Jīvakāṇḍa, V. 602.

2. Bhs., 5. 8. 221; 2. 1. 90.

can be studied in the light of many unique notions of matter as explained in the physical sciences.

Etymology of 'puggala' or poggala,¹ Skt. pudgala, has been dealt with by the Jainācāryas², Bauddhācārya,³ different foreign⁴ and Indian scholars including Sri S. M. Shah⁵ of Poona University in their respective manners of scholarly approach to the problem. According to the consensus of opinions of all scholars, the basic etymological meaning of the word 'puggala' is that the substance which undergoes transformation or modification by the process of integration and disintegration⁶ is called puggala or poggala, Skt. pudgala, although it still remains as a problem to be solved, as it has been used in the sense of both Matter and Soul or empirical being in the Jaina tradition⁷ and Soul or personality in the

1. TS., V. I.
2. Pūraṇādgalañācca pudgalah etc.. Tattvārthādhigamasūtra, Tīkā by Siddhasena Gaṇin on V. 7, p. 316.
Pūraṇagalañānvarthasamjñātvāt pudgalah, etc.. —
Tattvārtha Rājavārtika, V. 19, Tīkā ;Puṇgilādvā...athavā pumāṁśo jīva te śarīrahāraviṣayakaraṇo pakaraṇādibhāvena gilanta iti pudgalah— Ibid.; Poggale iti pūraṇādgalañācca śarīradinām pudgalah— Bhagavati Vyākhyāprajñapti Vṛtti, Vol. III, pp. 776 ff.;
3. Visuddhimagga, 310.
4. Prof. P. Desco, Sanskrit 'pudgala', body, soul, — Journal of American Oriental Society, Vol. 67, pp. 172-77; Prof. Franklin Edgerton, Buddhist Hybrid Sanskrit Grammar and Dictionary, Vol. II, Delhi, 1970, p. 347; Pāli-English Dictionary, Dravidian Etymological Dictionary, Oxford, 1961, Word No. 3494, p. 283.
5. Śrī S. M. Shah, On the Etymology of Pudgala or Poggala, Sambodhi, Vol. 4, Nos. 3-4,
6. Tattvārthādhigamasūtra, Umāsvāti, p. 316
7. Bhs. 20. 2. 664.

Buddhist tradition¹ respectively. So the nature of Puggala, according to the accepted Jaina tradition, is to integrate and disintegrate.² On account of this nature of it name 'Puggala' or 'poggala', Skt. 'Pudgala' has been attributed to the permanent substance—Matter in Jaina philosophy.

This Jaina concept of Matter may be compared with the concept of matter in the physical sciences to some extent where it is conceived as the substance in the sense of stuff of which the material Universe is constituted, undergoing changes by the process of integration and disintegration.³ So the concept of Matter of the Jainas comes nearer to that of matter of the physical sciences in some respects. In Jaina metaphysics matter is conceived as a substance (dravya) endowed with quality (guṇa) and mode (paryāya)⁴ and it is studied from the aspects of substance (dravya), locus, (kṣetra) time (kāla and condition (bhāva)⁵ on the basis of the metaphysical speculation which runs parallel to some extent to the conception of Matter as found in Western philosophy and modern physics in which Matter is conceived as one of the ultimate principles of substances of which phenomena are manifestations.

According to Jaina philosophy, Matter (pudgala) is a permanent, non-living, extensive, physical, corporeal and concrete, active, disintegrating and integrating, and changeable substance.⁶ It is infinite in number, co-extensive with the Universe (Loka), possessed of the capacity to be received by

1. Kecit Saugatammanyā apyātmānam pracakṣate, pudgalavyapadeśena tattvānyattvādīvarjitam—
Tattvasaṁgraha 336, Śāntarakṣita, Gaekwad's Oriental Series.
2. Bhs. (Comm.) 20. 2. 664, etc.
3. Cosmology, Old and New, pp. 58-64; See also Physics, p. 2.
4. Bhagavati Vyākhyāprajñapti, 2. 10. 118; Anuyogadvāra, 4. 727; Uttarādhyayanasūtra, 28, 5-6.
5. Bhs., 2. 10, 118.
6. Bhs., 2. 10. 118; TS. V. 1, 2. 3, 4, 6; Dravyasaṁgraha, 15.

Soul¹ and to be of assistance to it.² It is characterized by origination, decay and permanence without giving up its essential nature of existence.³

A comparative study of the Jaina concept of Matter with those of other Indian systems of thought reveals that according to the Sāṃkhya there is Prakṛtitattva (Primordial Matter) among many successive changes, ever existing and all-pervading; again, however, it is itself attaining also other states in accordance with the changes. Of course it is formless, unmanifest and undifferentiated like atoms of Jaina metaphysics in its unmanifest states.

The Nyāya-Vaiśeṣika maintains the view that when newer and newer effects like substances, etc. get produced, then an atom (paramāṇu) as the basis of these effects exists as Kūṭasthanitya (absolutely permanent) without any kind of change. According to Jaina metaphysics also, an atom too is the basis of newer and newer material effects. Nevertheless, atoms are not by any means different and independent from the effects like those of the Nyāya-Vaiśeṣika. But there is one point which is the same in the Sāṃkhya, Nyāya-Vaiśeṣika and Jaina systems of thought that the individuality or self-identity of the fundamental substance as substratum is to remain as whole or non-divisible (akhaṇḍa). As, according to the Sāṃkhya view, the identity of Prakṛtitattva exists as whole or non-divisible from the points of view of all-pervasive substratum⁴, just so the infinite-fold infinite atoms exist as permanent,

1. Bhs., 2. 10. 118; Sakasāyatvājjīvah karmano yogyān pudgalānādatte—TS., VIII. 2.
2. Sukhaduhkhajīvitamaranopagrahāśca. TS., V. 20, p. 343.
3. Apariccaittasahāvenūppadavvayadhvuttasamjuttam
Guṇavaṁ ca sapajjayaṁ jaṁ tam davvaṁ ti vuccānti
—Pañcāstikāyasāra, II, 3.
4. Mūlaprakṛtitiravikṛtīmahadādyāḥ prakṛtivikṛtayah sapta
śoḍaśakastu vikāro na prakṛtirna vikṛti puruṣāḥ
—Sāṃkhyakārikā, 3.

according to the Nyāya-Vaiśeṣika¹ and Jaina² concepts of Matter. The Buddhist philosophy calls the Universe rūpātmaka (material). Rūpa does not connote only the meaning ‘perception’ to the eye, but it calls all the bhūtabhautikatattvas (primary and secondary elements of matter) by this term which can be apprehended by the sense-perception. Like the Nyāya-Vaiśeṣika and Jaina schools of thought the Buddhist philosophy also, keeping in view the perceptible gross matter, material effects like taste, etc., as prominent, was engaged in the consideration of its cause. It has also admitted the doctrine of similarity in the postulation of causality (kāryakāraṇa), i. e. as there is an effect, so there is a cause. If the material effect is perceptible to the senses of taste, etc., then its fine, finer and finest (i. e. intangible) ultimate cause also is as such, that is to say, it can be only as rūpa (colour and shape), rasa (taste), gandha (smell), sparśa (touch), etc.

According to this consideration, the Buddhist philosophy has made a reference to all gross and fine elements of matter of the universe by using the word ‘Rūpa’. But there is a gulf of difference between the Buddhist concept of Rūpa and the Nyāya-Vaiśeṣika and Jaina concepts of Rūpa. The Buddhist tradition also is anu-paramāṇuvādin (advocate atomism) like the Nyāya-Vaiśeṣika and Jaina systems of thought. Nevertheless, its postulation of the concept of Matter appears to be distinct from Prakṛtivāda of the Sāṃkhya on the one hand and the doctrine of eternal and infinite ultimate atoms (anantaparamāṇuvāda) of the Nyāya-Vaiśeṣika and Jaina schools of thought on the other.

The Buddhist philosophy is the advocate of manifoldness (or multiplicity) of elements of matter, but it does not admit the conception of permanence of any entity. It advocates that

1. Āśritatvām cānyatra nityadravyebhyah anāśritatvānityatve cānyatra avayavidravyebhyah—PPBha,
Dravyadhāraṇāprakaraṇa.
2. Nityāvasthitānyarūpāṇi— TS., V. 3;
Rūpiṇah pudgalāḥ— Ibid., V. 4.

the constitution of reality is always subject to change or being changed. It does not accept the change in entities under the influence of an independent reality called time, but it calls the series of evolving momentary changes due to the intrinsic nature of an entity as time. By this method, like the Sāṃkhya and Jaina systems of thought, it does not admit any such reality as ever existing (i. e. permanent) in the current of the would-be newer and newer changes at every moment, but it accepts ever dynamic momentary changes.¹

Nature of Matter

A detailed analysis of the characteristics² of Pudgala(Matter)

1. Bhāratīyatattvavidyā, p. 63.
2. It is a non-living Substance (Ajīvakāyā dharmādharmā-kāśapudgalāḥ dravyāṇi jīvāśca TS., V. 1-2; it is eternal and permanent (Nityāvasthitānyarūpāṇi ca rūpiṇah pudgalāḥ), TS., V. 3—4; it is non-living (Bhs., 2. 10. 108; TS., V. 1); it is extensive (Parameatthikāyā paṇḍitā...poggalatthikāe), Bhs., 2. 10. 118; it is endowed with body (Bhs., 2. 10. 118; TS., V.1); it is corporeal and concrete (Rūpiṇah pudgalāḥ), TS., V. 4; DS., 15.; it is active (Pudgalajīvāstu kriyāvantah), TS. Bhāṣya, V. 6, p. 236. it is subject to dissociation and combination (pūraṇādgalanācca pūḍgalāḥ), TS. Bhāṣya, V. 1, p. 316; it is changeable (Bṛhad-Dravyasaṃgraha, p. 67(DS.,) p. 31) it is finite (Davvao ḡam poggalatthikāe aṇamītāññ davvāim) Bhs. 2. 10. 118.; it is co-extensive with the Universe (Khettao loyappamāṇa-mette), Bhs., 2. 10. 118; it is possessed of the capacity to be received by Soul (Sakaṣāyatvājjīvah karmano yogyān pudgalānādatte), TS., 8.2.; it is of assistance to soul (Sukhaduḥkhajīvitamaranopagrahāśca) TS., V. 20.

as conceived in Jaina metaphysics throws light upon its nature. It is explained in the Jaina Āgamas and post-Āgamic works that Matter is eternal and constant in number; it was in the infinite eternal past samayas (times or instants), is at the eternal present samayas and will be in the infinite eternal future samayas.¹ On the basis of the Āgamic statement about the characteristics of Matter, Umāsvāti² and other later Jainācāryas have dealt with the nature of eternality attributed to it in detail. Ācārya Pūjyapāda explains it by maintaining that Matter never loses its general characteristics of existence, etc. and particular characteristics, such as, colour, etc. because these are indestructible characteristics like colour in it. It is fixed in number, for there does not take place any increase or decrease in its number, i. e. it remains constant.³ The qualities-eternity and fixity in number exist together in all substances permanently. To be eternal is not to lose its nature of permanence-in-change, i. e. that whose nature is not destroyed and that which is not destroyed by any means is eternal.⁴ "Since the fixed number is not violated, the substances remain fixed in number and do not at any time exceed fixed unit of six, so these are said to remain constant."⁵

Matter endowed with its quality and mode is eternal and fixed substance. Therefore, it will never be destroyed nor will it be converted into other substances.⁶ That is to say, Matter will remain the same as it is; whatever material substance there was in the past, (that much) is at present and will be in the infinite future. So it is eternal and fixed in quantity from the point of view of Dravya (substance). Matter which is non-living and by all means opposite to Soul is devoid of sentiency and consciousness, while the characteristic of Soul is conscious-

1. Bhs., I. 4. 42.

2. Nityāvasthitānyarūpāni, TS., V. 3.

3. Sarvārthasiddhi, p. 270.

4. Tadbhāvāvyayaṁ nityam TS., V. 30.

5. Sarvārthasiddhi, pp. 270-71.

6. TS., Bhāṣya Tīkā, p. 323.

ness.¹ Hence, Matter is not living because of being devoid of consciousness, but it is non-living.²

In regard to the nature of its existence it is explained that Matter is real,³ for astitva (existence) is the only one all-comprising characteristic of the five extensive substances amongst their various characteristics.⁴ It is the nature of the substances.⁵ That is to say, this nature is accompanied by its qualities and variegated modifications and origination, destruction and permanence for all times.⁶ So Matter is Traikālikāsti (existent in three points of time—past, present and future).⁷

Matter is rūpin (corporeal)⁸ and mūrta (concrete or tangible).⁹ The auto-commentary of the Tattvārthādhigama sūtra explains that rūpa (corporeality) is mūrti (concreteness),¹⁰ while Siddhasena Gaṇin elucidates the point by stating that parināma (resultant effect or transformation) of the aggregation

1. Upayoga lakkhaṇe jīve,—Bhs., 2. 10. 118;
Upayogo lakṣaṇam—TS., II. 8, p. 149.
2. TS. Bhā. Tīkā, p. 315.
3. Asti ityayaṁ nipāṭah kālatrayābhidhāyin—Bhs. 2. 10. 118 (comm.)
4. Iha vivihalakkhaṇāṇam lakkhaṇamegam saditi savvagayam,—Pravacanasāra, II. 5, p. 13.
5. Astitvam hi kila dravyasya svabhāvah, Ibid., p. 127, Pradīpikā.
6. Sabbhāvo sahāvo gunehim saha pajjahim cittehim Davvassa savvakālam uppādavvayadhuvattehim, PR. II, 4, p. 126.
7. Asti ityayaṁ nipāṭah kālatrayābhidhāyin — Bhs., 2. 10. 118 (comm.).
8. Bhs., 2. 10. 118; 13. 4. 481; Rūpiṇah pudgalāḥ -- TS., V. 4; Rūpam mūrtih — TS. Bhā., p. 322.
9. Rūpaśabdasyānekārthatve mūrtiparyāya-grahaṇam śāstrasāmarthyāt — T. RV., V. 5. 1, p. 441,
10. Rūpam mūrtih, mūrtyāśrayāśca sparśādaya iti — TS. Bhā. V. 4, p. 322.

of colour, taste, smell, touch and shape is *rūpa*.¹ The things which have corporeality are the material objects.² Matter is called *rūpin*, i. e. *mūrta* (concrete) because of *parināma* (transformation) produced by the aggregation of colour, taste, smell, touch and shapes like triangular, rectangular, etc.³ It is defined that *rūpaparināmī gunas* (corporeality-producing qualities), viz. touch, taste, smell and colour become forms of matter,⁴ i. e. forms of matter are characterized by touch, taste, smell and colour. According to Siddhasena Ḍaṇin, *guṇa* (quality), which is inherent in a *Dravya* (substance) but non-existent in other *Dravyas* (substances), is called *lakṣaṇaguṇa* (distinctive quality) and that by which an object can be determined is the characteristic of it.⁵ One object can be distinguished from another by its *lakṣaṇaguṇa*. Matter only is *rūpin* (corporeal), while other fundamental substances are *arūpin* (non-corporeal). That which is *rūpin* is *mūrta*. *Mūrtatva* (concreteness or tangibility) of Matter is brought about by particular *parināma* (*viśiṣṭa parināma*) of colour, taste, smell and touch.⁶ Therefore, a thing which is *rūpin* is *Pudgaladravya* (material substance)⁷, no form of Matter can be *arūpin*, i. e. devoid of colour, taste, smell, and touch.⁸ *Rūpitva* (corpo-

1. *Mūrtirhi rūpādiśabdābhidheyā, sā ca rūpādi samsthānaparināmāḥ*, TS. Bhā. Tīkā, p. 323.

2. *Rūpameśāmasti rūpiṇāḥ*, Ibid., p. 322.

3. *Tattvārtha Rājavārtika*, p. 444.

4. *Sparśarasagandhavarṇavantāḥ pudgalāḥ* — TS., V. 23, p. 355; *Sparśaḥ rasāḥ gandhaḥ varṇa ityevaṁ lakṣaṇāḥ pudgalā bhavanti* — TS. Bhā., p. 355.

5. *Lakṣyate aneneti lakṣaṇām*, Ibid., II. 8, p. 149

6. *Rūparasagandhasparśā eva viśiṣṭaparināmānugṛhitāḥ santi mūrtiviyapadeśabhājo bhavanti* — TS. Bhā. Tīkā, V. 3, p. 324.

7. *Pudgalā eva rūpiṇo bhavanti, rūpameśāmastyeṣu vā asti rūpiṇāḥ* — TS. Bhā., p. 325.

8. *Na mūrtivyatitekena pudgalāḥ santi* — TS. Bhā. Tīkā, V. 4, p. 325.

reality) can never be apart from Matter. That in which there is arūpitva (non-corporeality) is not Pudgala¹ (Matter). Samavāya (inherence) of colour, taste, smell and touch in Matter is called rūpitva. The aggregation of these four qualities is called rūpatvaguṇasamavāya of Matter; colour or shape (varṇa or saṁsthāna) alone is not called rūpatvaguṇa. Wherever there is colour, there are certainly touch, taste and smell.² There is no such form of matter in which there can be found only three or any two or any one of them. None of them can be perceived to exist in other substances. These four qualities must be present in all forms of Matter whether atoms or molecules.

They exist also in all conditions of it—tangible or intangible, manifest or unmanifest. Akalanka maintains that Saṁsthāna (shape or figure) also is one of the characteristics of tangibility or corporeality of Matter besides varṇa (colour) rasa (taste), gandha (smell) and sparśa (touch). The meaning of saṁsthāna is ākṛti or ākāra (shape or figure), it can be the product or effect of the disintegrating and integrating nature of Matter.³

Matter is active.⁴ In Jaina philosophy Sat (reality) is characterized by origination, decay and permanence⁵; it is the basic principle of the Universe.⁶ All substances are permanent by their respective inherent co-existing qualities, while they are origination and decay—like by their respective, successive modes. The mode of substance arising from internal and external causes, which is the cause of its motion, is called

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1. Arūpāḥ pudgalā na bhavanti—TS. Bhā. Tīkā, V.4, p. 324.
 2. Yatra rūpapariṇāmāḥ tatrāvasyantayā sparśarasagandharipī bhāvyāṁ, atāḥ sahacarametaccatuṣṭayam,—Ibid., p. 323.
 3. Rūpādisaṁsthānapariṇāmo mūrtih,—Tattvārtha Rājavārtika, V. 5, 2, p. 444.
 4. Pudgalajīvāstu kriyāvantah—TS., V. 6, p. 326.
 5. Utpādavyayadhrauvyayuktaṁ sat, TS., V. 29, p. 374.
 6. TS., p. 327.

activity (*Kriyā*)¹. The entities are inactive from the point of view of quality. An entity can be called inactive by the prominence of the substantial stand-point and the non-prominence of the modal stand-point.² All entities are active from the aspect of origination and decay of their modes. They are active by the prominence of the modal point of view and the non-prominence of the substantial point of view.³ All substances are endowed with qualities and modes, therefore, they are inactive and active respectively. The permanence of quality in a substance can be called inactivity, while the origination and decay of mode in it are to be called activity, (*Kriyā*), modes of a substance are infinite, so there are stated to be infinite divisions or conditions of activity. Both Arthaparyāya and Vyañjanaparyāya⁴ take place in Soul and Matter.⁵ There are two kinds of *bhāva* (condition), viz. *parispandātmaka* (vibrating) and *aparispondātmaka* (non-vibrating).⁶ It is explained that Matter and Soul are active “*Pudgalajīvāstu kriyāvantah*”⁷. Activity has been stated to be characterized

1. *Ubhayanimittavaśadutpadyamānah paryāya dravyasya deśantarapraptihetuḥ kriyā*—*Sarvārthaśiddhi*, p. 272.
2. *Anutpādavyayotpādavyayadrśanāt* (25) *paryāyārthikaguṇabhāve dravyārthikaprādhānyāt sarve bhāvā anutpādavyayadarśanāt niṣkriyā nityāśca*—*TRV.*, p. 449.
3. *Dravyārthikaguṇabhāve paryāyārthikaprādhānyāt sarve bhāvā utpādavyayadarśanāt sakriyā anityāśceti*—*TRV.*, p. 449.
4. Arthaparyāya signifis those minute or subtle divisions in a series of changes, which are or appear to be indivisible, no name can be attributed to it, while *vyañjanaparyāya* indicates a series of changes which has such similarity as to allow it to be stated by a name—*Sanmatitarka*, III, 34, p. 440.
5. *Jīvapūḍgalānāṁ arthaparyāya-vyañjanaparyāyasca*,—*PRTV.*, II, 37, p. 182.
6. *Dravyasya hi bhāvo dividhāḥ parispandātmakah apari-spandātmakaśca*,—*TRV.*, 5, 22, 11, p. 481.
7. *TS. Bhā. V. 6*, p. 326.

by vibration or oscillation (parispandana). Vibration is the nature of Matter; activity takes place in it due to this vibrating nature and it is capable of being active.¹ Only by its capacity of vibration (parispandana śaktiguṇa). Therefore, it is active by its own capacity.²

In regard to the integrating and disintegrating nature of Matter it has been pointed out that the name 'Pudgala' is attributed to Matter because of its nature of integration and disintegration.³ A name is given to a thing according to its nature and activity.⁴ Matter integrates and disintegrates; the first cause of it is paramāṇu⁵ (ultimate atom), i. e. paramāṇu is the ultimate finest eternal cause and last unit of Matter. On account of their mutual touch or contact one paramāṇu sometimes integrates with another, and being united, again it sometimes disintegrates from a skandha (molecule) or combination in accordance with some scientific rules and so on. This process of integration and disintegration of paramāṇus takes place due to the integrating and disintegrating nature of Matter (Pudgala). Paramāṇus, being combined thus, transform themselves into the form of oneness. The name of this form of one state is called

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1. Pudgalāstu parispandasvabhāvatvāt parispandena bhinnā saṃghātenā, saṃhatā punarbhedenotpadyamānāvatiṣṭha-mānabhajyamānā kriyāvantaśca bhavanti—Pravacanasāra, II, 37, Pradīpikāvṛtti, p. 182.
 2. Sāmarthyāt sakriyau jīvapudgalaviti niścayah, Tattvārtha Ślokavārtika, 5.7.2, p. 398.
 3. Pudgalasabdo nirdiṣṭārthaḥ (40) Pudgalasabdasyārtho nirdiṣṭāḥ pūrigilanāt pūraṇagalānādvā pudgala iti, —TRV., p. 474.
 4. Pūryante galanti ca Pudgalāḥ dhātostadarthātīśayena yogāḥ mayūrabhramarādīvat—Śrutasāgara Vṛtti, Vide Jaina Padārthavijñāna men Pudgala, Mohalal Bathia, p. 25.
 5. Kāraṇameva tadantyaṁ sūkṣmo nityaśca bhavati paramāṇuh ekarasagandhavarṇo, dviparśah kāryaliṅgaśca —Āryā, TS. Bhā., p. 365.

Skandha¹ (molecule). There takes place also the union of one skandha (molecule) with another or more than one skandha like that of paramāṇu. On the division of the aggregate of paramāṇus, the disintegration occurs not only in the form of paramāṇus but it may happen also only in the form of skandha and in a mixed form of skandha and paramāṇu. The dissociation of some paramāṇus can take place only on the division of a skandha. The remaining skandhas may exist as they are. There can be a union or one or more paramāṇus with skandhas. The ultimate capacity and multifariousness of Matter are generated by its integrating and disintegrating nature.

As to the changing nature of Matter it is explained in Jaina metaphysics that Matter undergoes both ādi and anādi Pariṇāmas (transformation with a beginning and without a beginning)² Its ādi pariṇāmas are found in the transformation of its colour, taste, smell, touch, space, union, division, motion, sound and neither heaviness nor lightness,³ while its anādi pariṇāmas are experienced in its dravyatva (substantiality), mūrtatva (corporeality or tangibility), sattv (existentiality),⁴ etc.

Matter is infinite in number or quantity from the points of view of dravya (substance), kṣetra (locus), kāla (time) and bhāva⁵ (condition). That is to say, it is infinite in number whether it is in the form of paramāṇu or skandha.

1. Pariprāptabandhapariṇāmāḥ skandhāḥ

—TRV., 5. 25. 16, p. 493.

2. Anādirādimāṁśca, TS., V. 42, p. 438.

3. Bhs., 8. 10. 355; Prajñāpanā Sūtra, Pariṇāmapada, 13; TS., p. 439.

4. Dravyatvamūrtatvasattvādayo anādyāpi pudgaladrave pariṇāmāḥ sentītyamūmarthaṁ viśināṣṭi,
—TS. Tīkā, p. 439.

5. Davvao poggalatthikāe aṇāṁtāiṁ davyāiṁ, Bhs., 2. 10. 118; Aṇāṁtā khettādeseṇavi evam̄ ceva kālādeseṇavi bhāvādeseṇavi evam̄—Ibid., 5. 8. 221.

Matter is equal to the extent of the Universe (*lokapramāṇa*) from the point of view of *Kṣetra*¹, i. e. it is co-extensive with the Universe, as it exists only in the space of the Universe (*Loka*). The forms of Matter occupy one point of space onwards.² Ācārya Kundakunda explains this problem by stating that the Universe is densely filled with several varieties of infinitefold infinite forms of Matter of subtle and gross nature in all directions.³ The auto-commentary of the *Tattvārthādhigama Sūtra*, while interpreting the *Sūtra* “*Ekapradeśādiṣu bhājya pudgalānām*” makes it clear that the accommodation (or immersion) of partless forms of Matter and forms of Matters having countable, countless and infinite parts (i. e. units of atoms) is in one point of space, that of binary compound or dyad (*dvipradeśika* or *dvyaṇuka*) is in one and two points of space, that of tertiary compound (*tripradeśika*) is in one, two and three points of space and so on up to those forms of Matter having countable, countless and infinite units of atoms are in countable, countless points of space of the Universe.⁴ Similarly, skandhas (molecules) formed of numerable, innumerable and infinite atoms are accommodated in one, countable and countless points of space of the Universe⁵ by their capacity of contraction of becoming subtle, just as the lights from several lamps intermingle.⁶

As to the point of nature that Matter is *Jīvagrāhya* (receivable by Soul) it is explained in the Āgama that Matter is endowed with the attribute of reception or attraction from the

1. *Khettao loyappamāṇamette*—Bhs. 2, 10. 118.
2. *Ekapradeśādiṣu bhājyah pudgalānām*—TS. V. 14, p. 333.
3. *Oghāḍhagāḍhanicido puggalakāyahehim savvado logo suhumehim bādarehim ya aṇāṁtāṇāṁtehim vivihehim*—*Pañcāstikāyasāra*, p. 70.
4. TS. Bhāṣya, V. 14, p. 333.
5. *Sarvārthaśiddhi*, p. 279.
6. *Avagāhanasvabhāvatvātsūksmapariṇāmācca mūrttimatām-apyavagāho na virudhyate ekāpavarake anekadīpaprakāśā-vasthānavat*—Ibid., p. 279.

stand-point of quality.¹ On the basis of the āgamic statement Umāsvāti defines the point in this way that the individual self attracts particles of Matter which are fit to turn into karmapudgala (karmic matter) as the self is actuated by passions. This is bondage.² There is no capacity in Matter to attract Soul, but there is only the quality in it to be received by Soul. It is the Soul which receives Matter by attracting it and thus attains bondage with it. All souls do not receive matter. Only the worldly souls receive matter which is capable of turning into karmic matter because of the nature of being associated with the transformation tinged with passions. Just as the digestive fire of the stomach (gastric fluid or juice) absorbs food suitable to it, so also the self attracts karmas of duration and fruition corresponding to the virulent, mild or moderate nature of passions.³

Function of Matter

The function of Matter is to form the basis of body and organs of speech and mind, and respiration.⁴ That is, soul attracts further forms of Matter fit to turn into karmic matter by the association of forms of Matter like mind, speech, and body. In other words, Soul, having attracted forms of Matter and attained bondage with the received forms of Matter, transforms those forms of Matter into the form of mind, speech and body and again it attracts more forms of Matter fit to turn into karmic matter by the contact of matters transformed by mental, vocal and bodily activities. Forms of matter which are only capable of transformation into karmic matter are received or attracted by Soul,⁵ but all forms of Matter are not receivable to it.

1. Guṇao gahaṇagunę—Bhs., 2. 10. 118.

2. Sarvārthasiddhi, pp. 376-7.

3. Ibid., pp. 376-7

4. Śarīrvāngmanahprāṇāpānāḥ pudgalānāṁ—
TS., V. 19, p. 341.

5. Sakaśayatvājjivāḥ karmaṇo yogyān pudgalānādatte
—TS., VIII. 2.

Matter in the form of paramāṇu (ultimate atom) cannot be attracted by Soul nor can it be received in all kinds of molecular conditions. Thus Matter, being transformed into the forms of body, speech, mind and respiration, comes in the service of Soul.¹

Similarly, the function of Matter is also to contribute to pleasure, suffering, life and death of living beings.² That is to say, forms of Matter render a service to the worldly souls by four means of upagraha (contributions), viz. pleasure, pain, life and death, having undergone transformation as body, speech, mind and respiration. "Owing to the presence of the internal causes of karma, which produce the feelings of delight and anguish, and in consequence of the ripening of external causes; such as objects, the disposition of agreeableness or affliction is pleasure or pain. The continuance of respiration in a being owing to the presence of the age-determining karma is called living (or life). The cutting off or destruction of respiration is death. Matter renders help to Soul in these respects, for these arise in the presence of material causes."³ All these modes like pleasure, pain, etc. in Soul are produced by Matter as material functions towards it. Souls and forms of matter exist in the Universe as being mutually bound, touched, immersed and tied to each other by attraction and getting mixed up like a jar and water or a sunken boat and water in a lake⁴ or intermingled with each other like milk and water.⁵ Of the general qualities of Matter, as conceived in the Nyāya-Vaiśeṣika system of thought impenetrability, perceptibility and mass of it (kāya) are essential aspects of its nature. Besides, it possesses colour, taste, smell, touch, priority, posteriority weight, fluidity, viscosity and impulse as the mūrtaguṇas (finite or subjective concrete

1. Sarvārthasiddhi, pp. 285-8.

2. Sukhaduhkhajīvitamaranopagrahāśca—TS., V. 20, p. 343.

3. Sarvārthasiddhi, pp. 288-9.

4. Bhs., I. 6. 56.

5. Sanmatitarka, I. V. 47.

qualities)¹ and also elasticity (sthitisthāpakatva)². As it is substantial, it has the following objective qualities, viz. number, magnitude, separateness, conjunction and disjunction³. Colour, taste, smell and touch are respectively specific qualities (Viśeṣaguṇas) of the four material substances, viz. earth, water, fire and air and besides weight, fluidity, viscosity and elasticity are particular physical qualities of Matter, while number, magnitude, separateness, conjunction and disjunction and impulse are its general qualities (sāmānyaguṇas).⁴

It is to be noted that almost all the features of the nature of Jaina Pudgala (Matter) with the exception of its grahaṇaguṇa (capacity to be received by Soul) are found to be existing in Matter as conceived in the Nyāya-Vaiśeṣika school in one form or other.

Ancient Greek Conception of Matter

According to Compedodes and Aristotle, all matter is composed of one primordial substance called hyle or yelm⁵ which is identical in all bodies. The difference between various substances exist as a result of the presence of certain qualities in the varying quantities (or degrees) placed upon the Prime Matter by the four elements, viz. fire, earth, air and water. This conception of hyle or yelm (Primordial Matter and its elements) can be compared with Pudgala of Jaina metaphysics. The concept of the Primordial Substance founded on the theory of Aristotle continued for over than two thousand years. On the basis of it Alchemy, the forerunner of modern nuclear physics, aimed at transforming elements, particularly making metals

1. Rūparasagandhasparśaparvatvāparatvagurutvadravatvasne-havegā mūrtaguṇāḥ—PPBhā., Guṇapadārthanirūpaṇam, p. 38.
2. Nyāyakandali, p. 272.
3. Saṅkhyāparimāṇapṛthaktvasaṁyogavibhāgā ubhayaguṇāḥ PPBhā.—Guṇapadārthanirūpaṇam, p. 38.
4. Ibid.
5. Atoms and the Universe, pp. 126-149.

form the base ones. With a view to achieving this end the alchemists made attempts to obtain pure Prime Matter by separating the four elements from a substance. Their complete failure to achieve this objective, i. e. the accomplishment of the transformation of elements by adding four elements in the suitable proportions, brought to light the long neglected Greek atomic theory by the beginning of the nineteenth century mainly as a result of the research work of John Dalton.¹

In Western metaphysics Matter is conceived as one of the ultimate principles or substances; the physical world consists of material (substances) with qualities and relations.²

In this light Matter is a permanent reality and the substratum of such qualities which are constantly co-existent as a group in it. In the physical sciences it is the substance in the sense of 'Stuff' which constitutes the whole material universe. Extension, impenetrability, transibility, mass, divisibility, porosity, compressibility, density and elasticity, etc. are the general or universal properties of Matter.³

Besides, it possesses colour, taste, etc. and the capacity of motion and the nature of dissociation and combination.⁴ The material universe consists of an almost infinite variety of material substances.

It is to be noted that like Jaina philosophy Western metaphysics and physics started with the conception of gross elements of Matter and gradually entered into the subtle atomic theory according to which all material substances are constituted of small units called atoms—the smallest fragment. Atoms means indivisible. But the definition of atom has been found absolute; later on, the physical sciences have demonstrated that atom is divisible.

Besides, the analysis of the nature of Matter as conceived:

1. Atomic Physics, p. 41.
2. Atoms and the Universe, p. 28.
3. Analysis of Matter, pp. 243-4.
4. Atoms and the Universe, pp. 126-149.

in Jaina metaphysics, in the light of physics, reveals that the features of the nature of Jaina Pudgala (Matter) are similar to those of Matter of the physical sciences to a considerable extent, though they differ on the point of *grahaṇaguṇa* (capacity to be received by Soul) of the former.

The above discussion on the concept of Matter in Jaina philosophy with a synthetic view of all other Indian concepts of Matter and that of Western metaphysics and physics shows how the problem was dealt with by the Jainācāryas in the absence of scientific verifying data of modern sciences about Matter which exists in space and continues in time with its static and dynamic forces in the cosmic Universe.

SECOND CHAPTER
ELEMENTS OF MATTER

According to Jaina philosophy, Pudgala represents the elements of Matter. Its effect is to offer resistance to causes which tend to produce a change in its position, configuration or motion. Ghātaśarīra (obstructive body) is a gross body which obstructs and is obstructed by other objects. A body which neither obstructs nor is obstructed by other objects is Aghātaśarīra (non-obstructive or fine body)¹. It can pass through any kind of Matter. That is to say, Ghātaśarīra which is the effect of Matter is impenetrable, while Aghātaśarīra is capable of passing through any kind of material substances, e.g. X-Ray. Rūpa of Buddhist philosophy also is impenetrable (sapratigha) like Ghātaśarīra of Jaina metaphysics.

Earth, water, fire, air, shadow, objects, four senses (indriyas) besides that of sight, sense-organs, physical mind, karmic matter and atom² (paramāṇu) constitute the whole material universe in the forms of molecules and atoms, as they are studied from the points of view of their grossest and finest constitutions. It is explained that "whatever is perceived by the senses, the sense-organs, the various kinds of bodies of beings, the physical

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1. Bādarasuhumudayeṇa ya bādarasuhumā havāmīti taddhehā
Ghādasarīram thūlam aghāda deham have suhumam—
Gommaṭasāra, 183, (Jīvakāṇḍa), p. 114.
 2. Puḍhavī-jala-chāyā-cauriṁdiyavisaya-kamma-khaṁdh-a
paramāṇu—Ṣaṭkhaṇḍāgama, Vol. III, p. 3.
Puḍhavī-jalam ca chāyā cauriṁdiya-visayakammapāoggā
Kammātīdā yevam chabbheyā poggalā hoṁti
—Pañcāstikāyasāra, 83, p. 81;
Puḍhavī jalām ca chāyā cauriṁdiyavisayakammaparamāṇu
Chavvihabheyām bhaniyām:poggaladavvām Jīnavarehiṁ
—GS. (Jīva), V. 602.

mind, karmāns and are concrete objects—all these are Pudgala (Matter)¹

There are stated to be six kinds of effects of Matter, viz. earth-embodiment (*pr̄thvikāya*), water-embodiment (*ap-kāya*), fire-embodiment (*tejakāya*), air-embodiment (*vāyukāya*), plant-embodiment or vegetable-embodiment. (*vanaspatikāya*) and mobile beings' embodiment (*trasakāya*),² as they are inhabited by souls. They exist in the grossest, gross, gross-cum-fine, fine-cum-gross, fine and finest³ forms from the point of view of grossness and fineness, perceptibility and imperceptibility—tangibility and intangibility. That is to say, Matter (*pudgalaskandha*) whose chedana (cutting as under), bhedana (division) and prāpaṇa (portability) can be possible elsewhere is called the grossest form of Matter (*bādara-bādara*), e. g. earth, wood, stone, etc; that whose chedana and bhedana are not possible, but prāpaṇa is possible elsewhere is known to be the gross form of Matter or molecule (*bādara pudgalaskandha*), e. g. water, oil, etc. that whose chedana, bhedana and prāpaṇa cannot be possible elsewhere, but which is capable to be perceived by the eyes is called the gross-cum-fine form of Matter or molecule (*bādarasūkṣma pudgalaskandha*), e. g. shadow, heat, moonlight, etc.; that which is the object of the four senses of hearing, smell, touch and taste, respectively are the fine-cum-gross form of Matter. (*Sūkṣmabādara-pudgalaskandha*), e. g. sound, objects of odour, taste and touch; that which cannot be apprehended by the five senses is called fine form of Matter, e. g. dyad (*dvyāṇuka*); and that which is indivisible ultimate atom is the finest form of

1. Uvabhojjam īndiehim ya īndiyakāyā mano ya kammāṇi
Jaṁ havadi mūttamannam tam savvam pudgaladavvam
—PS., 82,
2. Bhs., 24, (12-16). 792-7; Pravacanasāra, II, 76;
GS., VV. 702-703, 704-707.
3. Bādarabādara bādara bādarasuhumam ca suhumabāyaram ca
Suhumam ca suhuma-suhumam ca dharādiyam hodi
chabbheyam—GS.. (Jīva), V. 603.

Matter, e. g. dyad (*dvyānuka*); and that which is indivisible ultimate atom is the finest form of Matter (*Sūkṣmasūkṣma*). It is impenetrable, indivisible and incombustible'.¹

The Physical world is thickly filled everywhere with the material bodies—gross or fine, capable of being received or not (by Soul). The material universe comprises an almost infinite varieties of material substances, it is the receptacle of living and non-living substances and is occupied by infinite atoms. The most important point is this that each of the effects of Matter, when analysed, is ultimately found to have been constituted of one or more of elementary practices.

Elements of Matter in Other Indian Systems of Thought :

Earth, water, fire, air and ākāśa (ether) as mentioned in the first chapter, have been accepted by all other Indian systems of thought² as the basic elements of Matter which constitute the material universe. On the basis of this postulation the thinkers of different Indian schools of thought began to speculate about them with the development of Indian philosophy.

The Sāṃkhya-Yoga View on Elements of Matter :

According to the Sāṃkhya-Yoga philosophy, the visible universe is unbound and of multifarious forms (*viśvarūpa*). It is divided into the grossest, grosser and gross, and fine, finer and finest constituents. Earth, water, fire, air and ether (ākāśa), their respective atoms (i. e. five kinds of atoms—earth-atom,

1. Bhs., 20. 5. 670.

2. Sāmaññaphalasutta, Dīg' anikāya, Ajitakeśakambalī's view; Sūtrakṛtāṅga, 1. 1. 17-18; Śvetāśvatara Upaniṣad, 1.2; Brhadāraṇyaka Upaniṣad, 2. 4. 12; Viśeṣāvaśyakabhāṣya, gāthā, 15531; Nyāyamañjarī, Vijayanagaram Series, p. 472; Tattvopaplavasīmha, p. 1; Tattvasaṃgrahapañjikā, p. 205; besides see Sūtrakṛtāṅga Niryukti, gāthā, 30 and Gaṇadharavāda, Gujarat Vidyāsabhbā Prakāsana; the doubt of the third Gaṇadharava Vāyubhūti, p. 501; Majjhimanikāya II, Cūlamālūmkīya Sutta for avyākṛtapraśna, etc.

etc.) and five kinds of infra-atomic potentials (*tanmātras*), viz. *pṛthivi-tanmātra*, *ap-tanmātra*, *teja-tanmātra*, *vāyu-tanmātra* and *ākāśa-tanmātra*, represent the elements of Matter, produced from Mass or Inertia of *Prakṛti* (Primordial Matter). So there are three stages in the constitution of Matter. (1) "The original infinitesimal units of Mass or Inertia, absolutely homogeneous and ubiquitous, on which Energy does work, when the original equilibrium comes to an end (*Bhūtādi-tāmasā-haṅkāra*), (2) the infra-atomic unit-potentials, charged with different kinds of Energy, which result from the action of Energy on the original units of Mass (*tanmātra*), and (3) the five minute divisions of which gross matter is capable (possible), but which are themselves complex *tanmātric* systems (*sthūlabhū-taparamāṇu*)."¹

The Nyāya-Vaiśeṣika View on Elements of Matter :

Like the Sāṃkhya-Yoga school the Nyāya-Vaiśeṣika philosophy also holds the view that earth, water, fire, air and *ākāśa* (ether)² basically represent the elements of Matter, but mind, time and relative position or direction³ are also admitted by this school of thought as non-basic substances. So they are classified into two divisions, viz. *bhautika* and *abhautika* (basic and non-basic) elements.⁴

Earth, water, fire, and air exist in the universe in two forms, viz. eternal as atoms (*paramāṇus*) and, non-eternal as effects (*kāryadravyas*).⁵ These effects were non-existent before their generation and will be non-existent after their destruction, but the four elements of Matter—earth, water, fire and air have a permanent form of existence as atom before their production

1. The Positive Sciences of the Ancient Hindus, p. 24.

2. PPBhā., p. 22.

3. Ibid.

4. Ibid.

5. The Conception of Matter According to Nyāya-Vaiśeṣika, p. 61.

and after their destruction.¹ According to the Vaiśeṣika doctrine of Intransitive Causation (Ārambhavāda), a new production of them takes place every time out of their permanent form.²

Ākāśa (ether)³, the last basic substance provides the auditory organ in common with other basic material substances. Its property-sound is manifested through this auditory sense-organ.⁴ It is also all-pervasive like other ubiquitous forms of Matter, time and relative position, making up a basic principle of creation.⁵ Mind among the non-basic substances is atomic in nature and is endowed with the characteristic of motion and velocity⁶ like the non-ubiquitous physical forms of Matter, having this difference that its motion is the fastest of all. Time and relative position⁷ are admitted as non-basic, ubiquitous substances at the base of the cosmic order in agreement with ākāśa (ether or space)⁸. Thus it is evidently clear that earth, water, fire and air as the effects of their respective causes—earth-atom, water-atom, fire-atom, and air-atom are non-eternal forms of Matter. They have intermediate dimension (madhyama parimāṇa)⁹, hence they are subject to destruction. Each of them is ultimately produced from its ultimate cause.

The Mīmāṃsā View on Elements of Matter :

The Mīmāṃsā philosophy has propounded the theory of the structure of elements of Matter in the main agreement with the Vaiśeṣika system of thought with regard to the cate-

1. The Conception of Matter According to Nyāya-Vaiśeṣika, p. 61.
2. Ibid.; PPBhā. p. 24.
3. PPBhā., p. 22.
4. Ibid.
5. Ibid.
6. Ibid., p. 21.; VS., V. II. 13.
7. PPBhā., p. 22.
8. Ibid.
9. The Conception of matter According to Nyāya-Vaiśeṣika, p. 62.

gories of five elements of Matter—earth, water, fire, air and ākāśa (ether) and their qualities like colour, taste, smell, touch, etc. Therefore, the concept of elements of Matter of the Mīmāṃsakas like Prabhākara and Kumārila Bhaṭṭa agree, in general, with the Vaiśeṣika concept of elements of Matter, etc.¹

Criticism of the Nyāya-Vaiśeṣika View on Elements of Matter :

According to the Nyāya-Vaiśeṣika school of thought, the advocate of many reals, the thought which used to give prominence to the external sensual experience gave main consideration to the aspect of qualities like colour, taste, smell, touch, substantiality, etc., possessed by earthly, aquatic, fiery and airy elements of creation. It accepted the postulation of cause and effect and the law of similarity. In order to have an explanation of the becoming effects in the form of gross elements of these qualities like colour, etc., from their cause, this philosophy has accepted the causes of these perceptible gross elements also as endowed with uniform or equal or similar qualities (samānaguṇas), and it went forward in search of cause—tradition. In the gross earthly objects the qualities which are experienced must be existing in their causes also, and the cause will certainly be finer than the effect. Having thought like this, the Nyāya-Vaiśeṣika finally came to this conclusion that the ultimate cause of earth is only earth and the basic elements of aquatic, fiery and airy creations also must be only of the categories of their respective realities. The material realities which are conceived by it in the form of these ultimate basic causes were accepted as atoms only. The fineness of the ultimate atom falls in the last category of division beyond which no further division of material elements takes place.

In this way the Nyāya-Vaiśeṣika has propounded the theory of production of the effect-world on the basis of mutually distinct infinite earthly, aquatic, fiery and airy ultimate atoms.

1. *Prakaraṇapañcikā*, p. 78 (pp. 52 ff.); *Prabhākaramīmāṃsā*, pp. 35 ff.

of various categories. Having accepted this principle "to whatever extent may the cause be fine, it gradually makes the beginning of the gross and grosser effects by conjunction of fine causes of the categories," the Nyāya-Vaiśeṣika has established the theory of Intransitive Causation (*Ārambhavāda*), i. e. one new dyad is produced by conjunction of two ultimate atoms, which, even being different from the two causative ultimate atoms, exists, inhering in them. Thus this system of thought made the constitution of gross production of the effects like hill, river, sun, etc. by this order that one triad is produced by conjunction of three dyads and one tetrad by conjunction of four triads.¹

The difference of this doctrine of Intransitive Causation of the Nyāya-Vaiśeṣika school of thought from the doctrine of change (*Parināmavāda*) of the Sāṃkhya lies in the fact that the latter, having admitted the existence of all successive effects in the basic cause only, accepted the basic cause as existing in and through the effect even when the emergence of these effects is taking place by order. These effects which are going to be produced, do not come into the new existence by all means, but those which were existent in the cause as unmanifest become manifest on the attainment of favourable conditions of efficient cause, etc. But in the doctrine of Intransitive Causation all effects are different from the causes, and it is only accepted as such that new effects are produced a new. That is, infinite ultimate atoms of the four categories, having remained the same in their respective basic positions, begin to produce countless new effects on the strength of the materials out of themselves only.

In the doctrine of Intransitive Causation there is by all means the difference between effect and cause, while in the doctrine of transformation (*Parināmavāda*) of the Sāṃkhya there is the prominence of non-difference between cause and effect. In the former the causes of the earthly effects are the

1. PPBhā., Sṛṣṭiprakarana,

earthly ultimate atoms (e. g. earth-atoms) and those of the aquatic effects are the aquatic ultimate atoms (water-atoms). Infinite earth-atoms, even being of equal category as earth-atoms, are mutually very much related (*vyāvṛta*) and they preserve all the possible qualities which are inherent in earth-substance. According to the doctrine of Intransitive Causative, the four classes of infinite ultimate atoms, viz. earth-atoms, water-atoms, fire-atoms and air-atoms, have been accepted as the basic causes of the non-living (materials) universe and along with them, the eternal entities like ākāśa (ether), dīk (relative position or direction) and kāla (time) also have found place in the non-living universe. Thus the Nyāya-Vaiśeṣika philosophy accepts many realities on the basis of causes.¹

The Buddhist View on Elements of Matter :

According to the Vaibhāṣika school, Rūpaskandha (Matter) represents the following fifteen kinds of Dharmāyatana (bases of cognition), viz. (1) cakṣurindriya (sense of vision), (2) rasanendriya (sense of taste), (3) śravaṇendriya (sense of audition), (4) ghrāṇendriya (sense of smell) and (5) tagendriya (sense of touch), (6) rūpa (colour and shape), (7) rase (taste), (8) śabda (sound), (9) gandha (odour) and (10) sprāṣṭavya (tangible), i. e. five kinds of sense-objects, and five kinds of avijñapti (unmanifested matter). In all there are stated to be fifteen kinds of Rūpaskandha (Matter).² In the Jaina tradition also rūpa (colour) is prominent among the four inherent qualities of Matter, as is evidenced by the fact of its definition “Rūpiṇāḥ pudgalāḥ” (Matters are corporeal).³

The Visuddhimagga of Buddhaghosa maintains that there are stated to twenty four kinds of derived Matter (upādāya-

1. Bhāratiyātattvavidyā, Pandit Sukhlalji, pp. 58-60.

2. Rūpam pañcendriyānyarthāḥ pañcāvijñaptireva ca
Tadvijñānāśrayā rūpaprasādāścacakṣurādayāḥ
—Abh. K., 1. 9.

3. TS., V. 4.

rūpa), viz. cakkhu (eye), sota (ear), ghāṇa (nose), jihvā (tongue), kāya (body), rūpa (colour and shape), sabda (sound), gamdha (smell), rasa (taste), itthindriya (material quality of female sex), purisindriya (material quality of male sex), jīvitendriya (life and matter), hadaya-vatthu (heart), kāyaviññatti (intimation by body), vacīviññatti (intimation by speech), ākāśadhātu (elements of space-vacuum), rūpassa lahutā (lightness of matter), rūpassa madutā (pliancy of matter), rūpassa kammaññatā (adaptability of matter), rūpassa upacaya (integration of matter), rūpassa santati (continuance of matter), rūpassa, jaratā (decay of matter), rūpassa aniccatā (impermanence of matter) and kabilikāro āhāro (edible food).¹

According to the Theravāda school, all these twenty four derived forms of Matter are dharmas (elements), therefore, they should be admitted as ultimate elements. But many of them can be considered "rather as aspects, modes or qualities than separate entities. This is borne out by the commentarial description of some of these dharmas and a distinction drawn between nipphana and anipphana rūpa".² As for example, ākāśa-dhātu (element of space-vacuum) is described as pariccheda-rūpa (material quality of relative limitation), kāyaviññati and vacīviññatti (intimation by body and speech), together with lahutā, madutā and kammaññatā (lightness, pliancy and adaptability of matter) are stated to be vikārārūpas (material qualities denoting special conditions). The upacaya, santati, jaratā and aniccatā (integration, continuance, decay and impermanence of matter) are known as lakṣaṇarūpa (characteristics of matter). These ten kinds of rūpa are stated to be anipphanna-rūpa in order to point out their difference

1. Visuddhimagga, 14. 36, p. 309.

Of these only twenty three are mentioned in Dharmasaṅgavī. The hadayavatthu has later been added by the commentators to the list. See Dhs., A. IV, 112.

2. Abhidharmadīpa, Introduction, p. 91, They are termed also as parinipphanna and aparnipphanna in Dhs., A. IV, 119.

from the remaining fourteen of the twenty four derived forms of Matter, which are described as nippnhaṇa-rūpa.

According to Buddhaghoṣa, nippnhaṇa-rūpas are "those which transcend limits, change and characteristics and which are to be seized in their intrinsic nature (svabhāva)¹, while anippnhaṇa-rūpas are opposite in nature to them.² Nippnhaṇa-rūpas are endowed with their own nature, whereas anippnhaṇa-rūpas are not possessed of their own nature and are known only by relating them to svabhāva-rūpas.³ Their mention in the Abhidharma indicates an influence of the Vaiśeṣika philosophy, advocating the doctrine of Dravya (substance) and guṇa (quality). This was known to the Buddhist commentators, as is evidenced from the criticism of Buddhaghoṣa that rūpa and gandha (colour and smell) are the qualities of teja (fire) and pr̥thivi (earth) respectively.⁴

Some of nippnhaṇa rūpas can also be posited in the group of anippnhaṇa rūpas, e. g. jīvitendriya is not composed of a separate matter (rūpa), but only a name attributed to the life of matter; tthindriya and purisindriya, two material qualities of sex can be considered as different aspects of kāya (body); kabalikāro aharo (edible food) is nothing but a name attributed to the material quality of nutrition.⁵

Like the Visuddhimagga, the Abhidharmāmṛtaśāstra of Goṣaka provides a similar list of Rūpaskandha as noted below :

1. Abhidharmadīpa, Introduction, p. 91.
2. Paricchedavikāralakkhaṇabhbāvāt atikkamitvā sabhbāvena pariggahetabbato nippnhaṇam, sesam tabbiparītatayā anippnhaṇam — VM., 14. 73.
3. VM., T1, pp. 457-8.
4. Kaci panettha, tejādīnam guṇehi rūpādīhi anugayahabhbāvato ti kāraṇam vadanti te vaticabbā ko panevamāha; rūpādayo tejādīnam guṇā ti ? avinibbhogavuttisu hi bhūtesu, ayam imassa guṇo, ayam imassa guṇo ti na labhbā vattum ti — VM., XIV, 43, p. 310.
5. Abhidharmadīpa, Introduction, p. 92.

Rūpas=Twelve : Five prasāda rūpas(sensitive qualities) : Cakṣu (eye), śrotra (ear), ghrāṇa (nose), jihvā (tongue), kāya (body); seven viśaya rūpas : rūpa (colour), śabda (sound), gandha (smell) and rasa (taste); three kinds of spraṣṭavya (=touch or contact), i. e. tangible, tejodhātu spraṣṭavya (contact of fire or fire-tangible), and vāyudhātu spraṣṭavya (contact of air or air-tangible).

SIXTEEN SŪKṢMA RŪPAS

(Subtle forms of Matter)

Of them ten are anispanna rūpas (1-10), namely, (1) paricchedarūpa (=material quality of relative limitation), (2-3) vijñaptirūpas (=material quality of expression) : kāyavijñapti (bodily expression), vāgvijñapti (vocal expression), (4-6) vikāra-rūpas (=conditions of matter) : laghutā (=lightness), mṛdutā (=pliancy), karmajñatā (adaptability), (7-10) lakṣaṇarūpas (=essential characteristics of material quality) : upacaya upacaya (=growth), santati (=continuity), jarā (=oldness), anityatā (=impermanence or death), (11-12) bhāvarūpas (=material qualities of sex) : strītva (female), puruṣatva (male). (13) hrdayavastu (=heart, the seat of consciousness), (14) jīvitendriya (=vital force), (15) āhāra (=food). (16) apodhātu (=water); it is not included in the spraṣṭavya (tangible or contact).¹

Of the twenty four derived forms of Matter (upādāya rūpas) as mentioned in the Visuddhimagga only nine—the five sense-organs and four sense-objects, phoṭṭhabba (tangible), being incorporated in Mahābhūtas (fundamental material elements) can be regarded as dharmas (elements) possessing intrinsic nature (svabhāva) and hence real.² It is to be noted that these ten

1. Abhidharmāmrtaśāstra of Ghoṣaka, ed. by Śānti Bhikṣu, p. 12.
 2. According to the Sautrāntikas, four Mahābhūtas and four sense-objects are rūpa-dharmas.
- See Ālambanapariśā, Appendix D, p. 116.

rūpa—dharmas are in fact the ten of the eleven dharmas as embodied in both the Vaibhāṣika-Yogācāra list of rūpadharmas, i. e. five sense-organs—eye, ear, nose, tongue and body, and five sense-objects—colour, sound, smell, taste and touch or contact;¹ and avijñapti (unmanifested form of Matter).² Avijñapti of the Vaibhāṣikas has been incorporated by the Yogācārins in their eleventh category of rūpa called dharmadhātu paryāpanna (matter included in dharmadhātu).³ Avijñapti has not been accepted by the Sthaviraj; instead, sūkṣmarūpa (subtle form of Matter) has been admitted by them.⁴ In this sūkṣmarūpa many dharmas (elements) are included, such as; jarā (old age or decay), anityatā (impermanence), etc., which have been incorporated by Ghoṣaka, Vasubandhu and Asaṅga into Cittaviprayukta saṃskāras (i. e. composite energies apart from matter and mind).⁵

Bhadanta Ghoṣaka defines Avijñapti in this way : “Avijñapti arises either in a kuśala citta (good mind) or in a akuśala citta (bad mind), but not in a avyākṛta citta (neutral mind), because avyākṛta citta is very feeble in nature.”⁶ This simple definition of Avijñapti given by Ghoṣaka is similar to that given by Vasubandhu in the Abhidharmakośa—

Vikṣiptācittakasyāpi yo anubandhaḥ śubhāśubhah
Mahābhūtānyupādāya sā hyavijñaptirucyate.⁷

“Perhaps Vasubandhu was conscious of this; that is why he also like Ghoṣaka has given a simple definition in his commen-

1. Abhidharmāmṛtaśāstra of Ghoṣaka, p. 13.

2. Abhidharmāmṛtaśāstra, p. 13.

3. A Manual of Buddhist Philosophy, pp. 130 ff.;
see also Abhidharmāmṛtaśātra of Ghoṣaka, p. 11.

4. Sukhumarūpaṁ—Abhidharmmatto Saṃgraha, VI. 8.

5. Abhidharmāmṛtaśāstra of Ghoṣaka, p. 11.

6. Kuśalākuśalacittajam bhavatyavijñaptirūpam na tvavyākṛtacittam, tat kasya hetoh avyākṛtacittasyātidurbalatvāt (418), Vide Abhidharmāmṛtaśāstra, p. 11.

7. Abh. K., 1. 11.

tary on Kośa (1.11) which runs as follows" :

"Vijñaptisamadhisambhūtam kuśalākuśalarūpamavijñaptih"

The sphuṭārthā (commentary) of the Abhidharmakośa makes the point clear by stating that "the Ācārya has defined avijñaptirūpa in brief word to make it easily intelligible to the students".¹

Analysis of Elements of Matter as conceived in the Buddhist Philosophy :

According the Vaibhāṣika doctrine, dharmas (elements) capable to be apprehended by the sense of sight have been defined as Rūpa, just as in the Vaiśeṣika philosophy only the qualities like blue, yellow, etc. have been called rūpa, but the Vaibhāṣika school maintains that only colour has not been called rūpa just like that in its doctrine. Its view is that colours like blue, yellow, etc., and the shapes like shortness, length, etc., also have been called rūpa.²

In the Vaiśeṣika philosophy colour or dimension is not a substantial entity but inherent in the material substance and attributive in nature, but according to Vaibhāṣika school, they have not been admitted as such. Each of them has been accepted as separate entity. In Jaina metaphysics the qualities, such as, colour, etc. are admitted as inherent in the material substance and at the same time they are identical with and different from it.

Blue, red, yellow and white are the four kinds of colour. Cloud (abhra), smoke (dhūnra), dust (rajas), mist or vapour (mihika), shadow (chāyā), heat (ātapa), light (āloka) and darkness (tamah) are the eight kinds of secondary (apradhāna) colour; length, shortness, roundness (or circle), spherical, high, low, even and uneven are the eight kinds of shape. In the Vaibhāṣika school these twenty kinds of element as a while are

1. Śiṣyasukhāvabodhārthaṁ saṃkṣepato vākyena tadavijñaptirūpaṁ darśayatyācāryaḥ—Abh.K., 1.11, Sphuṭārthā.

2. That is, paramāṇus of the Vaiśeṣika also have been called rūpa by the Vaibhāṣikas.

defined as rūpa.¹

There are stated to be three divisions among these twenty kinds of rūpa under the category of varṇa (colour) and saṃsthāna (shape). The first division, i. e. colours, such as, blue, etc., is only varṇātmaka (associated with colour); the third division, i. e. shapes like length, etc., is only saṃsthānātmaka (associated with shape) and the second division is constituted of colour and shape together (varṇa and saṃsthāna). Here the question arises what is the necessity of mentioning the second division, as its place has been covered by the first and third divisions. In the cloud, etc. there is the assemblage of blue colour and the shapes like long, etc., so they will be included in the blue colour and shapes like long, etc. In reply to this question the Vaibhāśikas explain that the shapes like long, etc., belonging to the third division are kāyavijñapti dharma (bodily expression or physical intimation), i. e. they are a kind of activity (kriyā) of Kāyika saṃsthānaviśeṣātmaka (particular physical shape).² They are formed in the shape of length, etc. If a person goes on foot to some distance, the physical activity is considered as long; thus if he moves in circle, his activity (kriyā) is understood as round. So the physical action also, in fact, becomes of particular shapes like long, etc.

In the Vaibhāśika school the actions like going, etc. have been called 'Kāyavijñapti' (physical intimation).³ The Vaibhāśika view of action must completely be distinct from the Vaiśeṣika concept of action, for it has admitted the substance—substratum of action, as separate and permanent. So it has been possible to accept a separate entity called action (karma) in this system of thought by recognizing a separate substratum

1. Rūpam dvividhā viṁśatidhā—Abh. K., I. 10.

2. Kāyavijñaptisvabhāva iti. Kāyavijñaptirhi kadācit dīrghā kadācid—hrasvā kadācid—yāvadiśāteti. kīdṛśī punah sā avagantavyā; taḍālambanacittasamutthāpitarī yat kāyakarma—Abh. K., I. 10 Sphuṭārthā.

3. Ibid.

and its permanence. It is to be noted that karma (action) of the Vaiśeṣika school of thought corresponds to paryāya (mode) of Jaina metaphysics.

According to the Vaibhāṣika school, Dharmas (element) possessing the nature of momentary change has been accepted as momentary and a separate substantial entity has not been admitted as the substratum of action. Therefore, it is held that the existing (i. e. apparent) shapes like long, etc., have been called kriyā (action or activity) popularly. There cannot be a separate kriyā (action), although Dharmas are changing at every moment (pratik ṣaṇa-pariṇāmin).

These Kāyavijñaptirūpa-saṁsthānas (physical intimation-like shapes), such as, long, etc., are apprehended by the eye without the perception of colour (rūpadarśina)¹. One man perceives another one walking on road as long; there does not exist any apprehension of colour with that perception, i. e. perception of colour as co-existing with shape. That is to say, some one perceives even the body of a person as long and when he goes on some particular path, then that kriyā (going) is regarded as long. In the apprehension of physical length at the first sight there is the perception of colours, such as, blue, etc., as co-existing with it. So one perceives the colour of the body and its length simultaneously. But when one regards the going of that person as long, there does not remain the perception of any colour associated with that going. As these shapes are of the nature of Kāyavijñapti (physical intimation), so in order to explain them separately, the shapes, such as, long (or length), etc., have been defined in the third division. In order to inform that there are the shapes like long, etc., besides vijñaptisvabhāva (nature of intimation), cloud, smoke, dust

1. Vaibhāṣikāṇāmayamabhiprāyah nīlādigrahanamātapaśloka-grahaṇam vā saṁsthānanirapekṣam pravarttate; kāyavijñaptigrahaṇantu varṇanirapekṣam pariṣṭarūpāyatana-grahaṇantu varṇasamsthānapekṣam pravarttate—

Abh. K., I. 10 Sphuṭārthā.

and mist have separately been accepted in the second division. But the shapes of these objects are not at all of the nature of vijñapti (intimation). One does not comprehend these shapes as kriyā (action or intimation). Moreover, when one perceives their shapes like long, etc., then there must be the perception of any colour associated with them. That is, in that case there is produced a perceptual cognition of the two kinds of base (āyatana), viz. colour and shape (varṇa and saṁsthāna). If it is conceived that two cognitions are produced simultaneously but separately on various supports, it will be contrary to the postulation, for, according to the Vaibhāṣika views, the birth of two cognitions (Vijñānas) simultaneously is not admitted.¹ With a view to explaining separately the aforesaid shapes of the objects of perception conditional upon colour, i. e. there are the shapes like long, etc., of another kind which are different from the shapes of Vijñaptisvabhāva, cloud, vapour, etc. have been mentioned separately in the second division. Mention of ātapa (sunshine) and āloka (moonlight) is made in this division, hence it is stated that varṇātmaka rūpas (forms of matter associated with colour) also come across in particular case as saṁsthāna darśananirapekṣa (independent of perception of shape). In this case the warm sunshine and the cool moonlight have been denoted by the words 'ātapa' and 'āloka'² respectively.

In ātapa and āloka, which are perceived, only colour becomes their ālambana (support). But any kind of shape, such as, long, etc., does not become their ālambana. In all these cases colour is perceived without having any shape. Elsewhere shape becomes supported in the awareness (or intimation) of

1. Samanantarapratyayo hi tadānīm cittacaittalakṣaṇah eka-syaiva tasya nīlavijñānasya utpattau avakāśam dadāti-netareśām nīlāntarādi vijñānānām yugapadvijñanotpattyasambhavāt—Abh., K., 1. 6, Sphuṭārthā.

2. Ātapaḥ uṣṇaprakāśa sūryasya, ālokaḥ śītaprakāśa indoh—Abh., K., 1. 10, Rāhulakṛtavyākhyā.

colour. Of course, colour which is perceived in a picture is found to be endowed with shape, i. e. in all those cases each and every cognition exists having a support on both colour and shape.

As there is the variety of exhibited rūpas in colour and shape-consciousness (or intimation), twenty kinds of rūpa have been shown by dividing it into three groups in the Vaibhāsika texts. Dharmas (elements) which are known as earth, water, fire and air, in the worldly sense, will be included in the list of the aforesaid rūpa, for these elements also are just like the aggregate of ultimate atoms, having colour and shape. As in earth, there are also colour and shape in water and fire. Therefore, there are also the aggregate of colour and shape-atoms like earth. As no colour nor any shape of air can be perceived, so the question is whether the air-element belongs to rūpa or not. If not, then it will be outside the category of pañcaskandha. If it is, then it has been divided as skandha of Saṃskṛtadharmas (aggregate of non-eternal elements); this view will be affected by the fault of deficiency (nyūnatādoṣa). Rāhul Sānskrityāyana, while explaining this question in his Vṛttigrantha says that air also belongs to rūpa (matter), for black colour and circular shape of air can be perceived.¹ Yaśomitra has not said anything clearly about the colour of air. But the physical sciences have demonstrated that air has got bluish colour, if it is cooled down. Jaina philosophy also admits the colour of air like the physical sciences.

Earth is hard (of the nature of hardness or repulsion), water is cohesive (of the nature of attraction, i. e. the producer of lumpness of ground things), fire is of the nature of heat and air is motive (of the nature of motion)². Earth is repulsive (sandhāraka) because of being of the nature of hardness, water

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1. Vāyudhātūrapi pṛthivyādīvatvarṇasaṁsthāna rūpah, ata eva loke kṛṣṇo vāyuḥ, cakrarūpovāyuriti vyavahārah
—Abh. K., 1.3, Rāhulakṛtavyākhyā.
 2. Bhūtāni pṛthivīdhātūraptejo vāyu-dhātavah
—Abh. K., 1.12.

is attractive because of its nature of cohesiveness, fire is cooker or warm because of its heat, and air is motive because of its nature of motion.¹

These four elements are defined in the *Vaibhāṣika* texts as Dhātu (element) and Mahābhūta (fundamental or general elements of Matter). Now, it is clearly understood that according to the *Vaibhāṣika* school, 'rūpa' signifies colours, such as, blue, yellow, etc. and shapes, such as, short, long, etc. In the *Vaibhāṣika* work these parimāṇas (dimensions) have been explained by the name of saṁsthāna (shape), just as it is found in the Jaina works. Dharmas (element) which are known as earth, water, fire and are accepted as Rūpa (Matter) according to the said view because of colour and shape of these Dharmas on the basis of the above analysis of them.

In the *Vaibhāṣika* texts the objects having colour and shape have again been known by the appellation of Dhātu and Mahābhūta. The contention of this fact is this that as colour and shape, the same definition of earth, water, etc., are known by one term, Rūpa', because every one of them is Dharma having colour and shape. In order to explain them separately in the text pṛthivīdhātu, jaladhātu, tejodhātu and vāyudhātu (earth, water, fire and air) have been dealt with by such dhātvyantasamjñās (terminologies). They do not call to mind the meaning in the sense of colour and shape. On the other hand, hardness, etc. point separately to the list of ten objects having colour and shape. ²

The word 'Pṛthivīdhātu' denotes only hard natured colours and shapes, cohesive (attractive) colour and shape are not

1. Dhṛtyādikarmasaṁsiddhāḥ kharasnehoṣṇateraṇāḥ
—Abh. K., 1.12.
2. Pṛthivīdhāturaप्तेजोवायुधातवाह—Abh. K., 1.12;
Dhātugrahaṇāṁ varṇa saṁsthānātmakapṛthivyādinirāśā-
rthaṁ svalakṣaṇopādāya rūpadhāraṇādvā dhātava iti, kāṭhi-
nyādisvabhāvalakṣaṇāṁ cakṣurādyupādāyasvarūpāṁ ca da-
dhātīti dhātavaḥ — Ibid., Sphuṭārthā.

signified by it. The word 'Jaladhātu' or 'Ap-dhātu' brings up cohesive colour and shape; it does not signify hard natured colour and shape. The word 'Tejodhātu' denotes only heat-natured colour and shape; it does not bring forth colour and shape of any other nature. The word 'Vāyu-dhātu' denotes only motive colour and shape; it does not mean colour and shape of any other nature. In order to comprehend the characteristics like hardness, etc., which are possessed by the aforesaid elements endowed with colour and shape, these elements have been designated by the different terms like pr̄thivī-dhātu, etc., for the natures, such as repulsion, etc., are produced by them. For this reason they may have been called 'Bhūta'. Their constitution is very great, that is why they have been called Mahābhūta (fundamental or general element).¹

It is known that other entities are contained in earth. Ground things like śaktu (wheat powder), etc. become lump with the mixing of water in them. This cohesive quality (or tendency) is produced by water in them. For this reason water has been called 'Bhūta'. It is perceived that the cooking of foodstuffs is caused by fire, the raw mango ripens as a result of heat from the sunshine; the eaten food-stuff and liquid things drunk by some one (pītavastu) are cooked and digested by the fire of the stomach. This cooking function is performed by fire, so it is called 'Bhūta'. It is known that other things are moved or increased by the assistance of air.

If air blows in speed, the branches of leaves of the trees move to and fro; human body grows by vital air. This motion or activity of motion (prasarpaṇa or vyūhanavṛtti)² is caused by air. For this reason it is called 'Bhūta' in the Vaibhāsika

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1. Tairmahābhūtairudbhūtā vyaktāvṛttih dhṛtyādikāyesu te
ime tadudbhūtavṛttayah pr̄thivyaapejo vāyuskandhāḥ,
esām mahābhūtānām mahāsanniveśatvāt mahāracanatvāt
bhūtam tāvantīti bhūtāni—Abh. K., 1. 12, Sphuṭārthā.
 2. Vyūhanāni puṇarvrddhibh prasarpaṇam yeti
—Abh. K. 1, 12, Sphuṭārthā.

text. The elements which are the producers of various *vṛttis* (activities) are called *Mahābhūtas* for their vastness. Thus Dharma (element) having one and the same colour and shape has been called *Rūpa*, *Dhātu*, *Bhūta*, and *Mahābhūta* by name from different points of view.

In the empirical world none of the various elements which are regarded as elements like water, etc. is the aggregate of *Dhātus* of one and the same category. As for example, an earth element as an aggregate of any particular earth-atoms would not be perceived in the empirical world. If an atom is taken as an example of earth-elements, then it is found in an analysis that there is an admixture of water, fire and air elements in it. It would be called earth because of there being a capacity of it to contain other elements in it. In that case, having been there combined earth-atoms, it must be admitted that there is a mixture of water-atoms in it. As a result of chemical action (*pāka*) it has been transformed into the state of stone, so there is also a mixture of fire-atoms in it. As it is increasing (in volume), so it must be admitted that there is a mixture of air-atoms in it. By this order it should be understood that there is a combination of other elements in the elements like water, etc.¹

Besides the five sense-data (*indriyaviṣaya*), constituting external objects, the five sense-organs (*indriyas*) possessing colour and shape have been included in the list of *Rūpa* (Matter) and have been conceived as *rūpaprasāda* (translucent matter of sense-organs), which covers the body when it is living. They are the substratum of visual consciousness, etc.

According to Professor Stcherbatsky, this division of Matter (*Rūpa*) into objective sense-data and sense-organs is similar to the Sāṃkhya development of Matter along two lines, "the one with the predominance of the translucent

1. Upalādike hi pṛthivīdravye saṃgrahapañktivyūhanadarśanā-
cchesānām jalatejovāyūnāmastitvamanumIyate
—Abh. K., I. 17, Spūṭārthā.

intelligence stuff (sattva) resulting in sense-organs, the other with the predominance of dead matter (tamas) resulting in sense-objects in their subtle (*tanmātra*) and gross (*mahābhūta*) forms. In fact, the concept of *tanmātra* comes very near to the Buddhist conception of elements of matter (*rūpadharma*). The fundamental difference between the two conceptions is that in the Sāṃkhya system these elements are modification or appurtenances of an eternal substance. In Buddhism they are mere sense-data without any substance.¹

The Vedāntist View on Elements of Matter

The Vedāntist view on the elements of Matter is almost similar to that of the Sāṃkhya-Yoga system of thought. The only fundamental difference is this that *Māyā*¹ (illusion) is admitted as the material cause of the Universe in place of *Prakṛti* of the Sāṃkhya-Yoga. Besides, Matter is regarded without having atomicity² of structure. According to the Vedānta, the five *Mahābhūtas* (gross elements of Matter), viz. earth, water, fire, air and ether, and their five *sūkṣmabhūtas* (subtle forms of matter) represent the elements of Matter. The gross earth-matter is constituted of four parts of subtle earth-matter and one part of each of other forms of subtle matter. Similarly, it is the principle with other gross forms of Matter, viz. water, fire, air and ether (*ākāśa*) in regard to their respective constitution.

The following table represents the constitution of gross Matter (*Mahābhūta*), if *āk*, *v*, *t*, *ap* and *kṣ* stand for the five forms of subtle matter (ether, air, fire, water and earth) and *ĀK*, *V*, *T*, *Ap* and *Kṣ* for the corresponding five forms of gross Matter :—

ĀK = *āk*⁴ (*v*₁ *t*₁ *ap*₁ *kṣ*₁), *āk*⁴ being the radicle.

V = *v*⁴ (*āk*₁ *t*₁ *ap*₁ *kṣ*₁), *v*⁴ being the radicle.

T = *t*⁴ (*āk*₁ *v*₁ *ap*₁ *kṣ*₁), *t*⁴ being the radicle.

1. The Central Conception of Buddhism, p. 10.

2. *Brahmasūtra*, I. I, *Sāṅkarabhāṣya*; *Pañcadaśī* I.

3. *Brahmasūtra*, II 2.II., *Sāṅkarabhāṣya*; *Pañcadaśī* I.

$Ap = ap^4 (\bar{a}k_1 v_1 t_1 k\dot{s}_1)$, ap^4 being the radicle.

$K\dot{s} = k\dot{s}^4 (\bar{a}k_1 v_1 t_1 ap_1)$, $k\dot{s}^4$ being the radicle.

The potential energies become actualized in the forms of gross forms of Matter in this way that "The Mahābhūta Ākāśa manifests sound, vāyu, sound and mechanical energy; Teja,—sound, mechanical energy and heat-light, Ap—the energy of taste - stimulus in addition and finally Kṣiti - Earth,—the energy of the smell stimulus added to the foregoing.¹

"The Sūkṣma Bhūtas are forms of homogeneous and continuous matter, without any atomicity of structure; the Mahābhūtas are composite; but even these are regarded as continuous, and without any atomic structure. The Vedānta speaks of Anu not as ultimate indivisible discrete constituent of matter; but as the smallest conceivable quantum or measure. Here this philosophy differs from the Sāṃkhya doctrine of the atomic structure of Matter."² But the philosophy of Mādhyavā³, the only Vedāntist, supports the atomic growth of Matter by accepting the aforesaid five elements. Jaina metaphysics basically disagrees from the Vedānta on this point of its doctrine of the atomic structure of Matter and the formation of its elements, although this philosophy accepts the four elements - earth, water, fire, and air in common with the Vedānta.

Earth, water, fire and air⁴ have been accepted by all other

1. The Positive Science of the Ancient Hindus, p. 87.

2. Ibid., p. 88.

3. Pūrṇaprajñādarśana.

4. Sāmaññaphalasutta, Dīghanikāya, Ajitakeśakambali's view; Sūtrakṛtāṅga, 1. 1. 17-18; Śvetāśvatara Upaniṣad, 1. 2; Brhadāraṇyaka Upaniṣad, 2. 4. 12; Viśeṣāvaśyakabhāṣya, gāthā, 15531; Nyāyamañjarī, Vijayanagara Series, p. 472 Tattvopaplavasimha, p. 1.; Tattvasamgrahapañjikā, p. 205; Sūtrakṛtāṅga Niryukti, gāthā 30.; Gaṇadharavāda, Gujarat Vidyāsaḥṭhā Prakāśana, the dōubt. of the third Gaṇadhara, Vāyuphūti, p. 501; Majjhimanikāya, II, Cūlamālumklyasutta of avyākṛtaprāśna, etc.

Indian systems of thought as the basic elements which constitute the material universe, so there appears to be a close relationship of the structure of elements of Matter of Jaina metaphysics with those of other Indian schools of thought.

The Jaina concept of Pudgala (Matter), when compared with that of hyle or ylem¹ of Greek philosophy shows that originally the name 'elementary particle' was applied to the four elements only - fire, earth, air and water. The Jaina conception of elements of Matter appears to be unique in its originality, for it has given place to Indriyas (senses)², Karmic matter³ and Leśyā (condition of soul)⁴ also as the material elements in its fold on the basis of the psycho-physical aspects of the material universe. A study of the order of the elements of Matter reveals that Jaina metaphysics commenced with the conception of the grossest forms of Matter and went deep into that of its finest form—the subtle force by stages in dealing with the problem like general metaphysics and physics of the West.

According to the modern physical sciences, there are stated to be one hundred three elements of Matter. There are as follows ; hydrogen, helium, lithium, beryllium, boron, carbon, nitrogen, oxygen, fluorine, neon, sodium, magnesium, alluminium, silicon, phosphorus, sulphur, chlorine, argon, potassium, calcium, scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, gallium, germanium, arsenic, selenium, bromine, krypton, rubidium, strontium, yttrium, zirconium, niobium, molybdenum, technetium, ruthenium, rhodium, palladium, silver, cadmium, indium, tin, antimony, tellu-

1. A History of Greek Philosophy, W. K. Guthrie, Vol. III,
p. 141.

2. Bhs., I.7.61; TS., II. 15.

3. Saṅkhaṇḍāgama, Vol. III, p. 3.
Pañcāstikāyasāra, 83;

Gommaṭasāra (Jīva); 602. Bhs., 1. 2. 22.

4. Pañcāstikāyasāra, 89.

rium, iodine, xenon, cacassium, barium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, yetterbium, lutecium, hafnium, tantalum, wolfram, rhenium, osmium, iridium, platinum, gold, mercury, thallium, lead, bismuth, polonium, astatine, radon, francium, radium, actinium, thorium, protactinium, uranium, neptunium, plutonium, americium, curium, berkelium, californium, einsteinium, fermium, mendelevium, nobelium and lawencium.¹

It is noteworthy that the Jaina literature mentions a number of basic elements of Matter some of which are common to both the physical sciences and Jaina chemistry, e. g. silicon, sulphur, iron, zinc, copper, tin, lead, silver, gold, mercury,² etc. It shows that like the alchemists of the middle ages the Jainācāryas also conceived the idea of pure elements of Matter as distinguished from its base forms on the basis of the knowledge of their experimental study of making gold, silver, etc.³ with their keen insight in the womb of Nature even in the absence of developed experimental science of modern age.

1. General Chemistry, Pauling.

2. Suvarṇa-Raupya-Siddhi-Śāstra, Jinadattasūri (VS. 1210).

3. Ibid.

THIRD CHAPTER
INDRIYAS, KARMA AND LEŚYĀ

FIRST SECTION
INDRIYAS (Sense-Organ)

Indriyas have been studied in Indian philosophy from the points of view of etymology of the word 'Indriya', cause of indriyas, their place, their number, their object, their shape, their mutual identicality and difference, their kinds and distinction of apprehensibility of substance-quality dravyaguṇagrahitvaviveka, etc. The earliest reference to its etymology is come across in the Pāṇini Sūtra.¹ The same etymology of the word 'Indriya' found its way in the early Buddhist and Jaina texts like Visuddhimagga² and Tattvārthaśādhwigama Sūtra's Bhāṣya³ respectively. Besides, it is also recorded in the Jaina āgama Bhagavatī Vyākhyāprajñapti.⁴

In the history of the etymology of the word 'Indriya' there are mainly two things to be noted—the one is that the Buddhist grammarian and Pāṇini's commentator have given place to that

1. Indriyamindralingamindradṛṣṭamindrasṛṣṭamindrajuṣṭamindradattamiti vā—Pāṇini, 5. 2. 93.
2. VM.XVI Indriyasaccaniddesa, 4, 5, 6, Vide Darśana and Cintana, p. 134.
3. Pañcendriyāṇi bhavanti; ārambho niyamārthaḥ ṣaḍādiप्रतिशेद्धार्थाश्च; indriyamindralingamindradṛṣṭamindrajuṣṭamindradattamiti vā (Pā. A. 2, Pā. 5, sū. 93); indro jīvaḥ sarvadravyeṣvaiśvaryayogāt viṣayeṣu vā paramaiśvaryayogāt, tasya liṅgamindriyāṁ, liṅganāt sūcanāt pradarśanādupaṣṭambhanād—vyañjanācca jīvasya liṅgamindriyām—TS. Bhā., II. 15, p. 162.
4. Bhs., 1. 7. 61, 7.

etymology in their respective works in details, while Ācārya Hemcandra,¹ the independent Jaina grammarian also has given position to it in his own Vyākaraṇa Sūtra and Vṛtti in full details. The other point is that the etymology of the word 'Indriya' is not found in any Vedic philosophical work except in the very oldest commentarial works of the Pāṇini Sūtra, just as it is come across in the Buddhist and Jaina texts. It is known that the etymology of the word 'Indriya', having found place in the Buddhist and Jaina philosophical treatises, became the subject of speculation of the philosophers. As for example, in the Māṭharavṛtti,² the oldest Vedic philosophical treatise, there is preserved the etymology of the word 'Indriya', but it is quite different and distinguishable from that recorded in the Buddhist and Jaina works. It is gratifying to note that when the nirukti (etymology) of this word 'Indriya', having left the field of word, entered into that of philosophy, then the stamp of the philosophical community got impressed on it. Buddhaghosa³ speaks of all those meanings as spoken of by Pāṇini in the nirukti of the word 'Indriya', but he has made an attempt to adopt it by stating the meaning of Indriya as Sugata.⁴ The Jaina Ācāryas interpret the meaning of the word 'Indriya' as only Jīva generally; they have not made the meaning of it as Trthaṅkara like Buddhaghosa as desired by himself.

According to the Sāṃkhya, the material cause of the indriyas (sense-organs) is abhimāna (ego) which is a kind of fine substance produced from Prakṛti.⁵ This view is acceptable

1. Indriyam', Hemaśabdānuśāsanaiḥ, 1. 174, p. 128.

2. In iti viṣayāṇām nāma, tānīnāḥ viṣayān prati dravantīti indriyāṇi, Māṭharavṛtti, kā. 26, p. 43.

3. Tippaṇī, 2, Darśana and Cintana, p. 134.

4. Ko Pana nesam indiyattho nāmāti ? indralimgaṭṭho indriyattho...bhagavā hi sammāsaṁbuddho paramissariyabhāvato indoattho vinicchayo VM. XVI. 4, 5, 6.

5. Sāttvika ekādaśakah pravartate vaikṛtādahaṅkārāt
Bhūtādestanmātrah sa tāmasah, taijasādubhayam

—Sāṃkhyakārikā, 25.

to the Vedānta. The Nyāya¹ maintains that the cause of the indriyas is the five elements like earth, etc., which are nothing but non-living substances. This view is acceptable also to the Pūrva Mīmāṃsakas. According to the Buddhist philosophy, the five sense-organs, because of being produced from rūpa (Matter), are called rūpa, which is particularly non-living. Jaina philosophy also makes reference to particular matter as the cause of the gross physical sense-organs (dravyendriyas), which is a particular non-living substance only.

The external shapes like karṇaśaṣkutī, akṣigolakakṛṣṇasāra, triputikā, Jihvā and carma (ear-drum, eye-socket-pupil, nose, tongue and skin), which the common people call by the order of the names—karṇa, netra, ghrāṇa, rasanā and tvak—indriyas (sense-organs of hearing, sight, smell, taste and touch) respectively, have been accepted as indriyādhiṣṭhāna² (places or substrata of sense-organs) in all Indian systems of thought, but not as indriyas. Indriyas have been accepted as intangible entities existing in those shapes whether they are material or egoistic. Jaina philosophy, having accepted those material adhiṣṭhānas as dravyendriya (physical sense-organ) even, has indicated the same idea that adhiṣṭhānas are not really indriyas. According to this school, indriyas are intangible. But they, being not material (bhautika) or egoistic non-living substance, are consciousness or sentient capacity—like which is called bhāvendriya (psychical sense-organ) by the Jainas. The sixth indriya called manas (mind) has been accepted as the internal sense-organ in all the Indian systems of thought. Like these six buddhīndriyas (organs of intellect) are common to all philosophies. But it is only the Sāṃkhya philosophy which mentions eleven indriyas³ by counting the five karmendriyas (sense-organs of action), viz.

1. Ghrāṇarasanaacakṣusivakṣrotrāṇīndriyāṇī bhūtebhyaḥ,
—NS., I. 1. 12.
2. Nyāyamañjari, p. 477.
3. Abhimāno ahaṅkārastasmād-dvividhah pravartate sargah.
Ekādaśakaśca gaṇastanmātrah pañcakaścaiva.—Sāṃhk-yakārikā, 24.

speech, hands, foot, anus and the organ of procreation¹ as indriyas. Just as Vācaspati Miśra and Jayanta Bhāṭṭa² spoke against the acceptance of karmendriyas of the Sāṃkhya as indriyas, just so Ācārya Hemacandra also, having refuted indriyatva (the state of sense-organ) of karmendriya, followed the previous Jaina Ācāryas like Pūjyapāda and others who argued in this manner : "This is the section dealing with consciousness. Those that are the instruments of consciousness alone are mentioned here, and not those that are the instruments of activity as these have no such limits. All the limbs and minor limbs are the instruments of activity. And these are determined by name-karmas of limbs and minor limbs. Moreover, the instruments of action are not five only."³

Here the question arises when Ācārya Pūjyapāda and other old Jainācāryas and scholars like Vācaspati, Jayanta Bhāṭṭa and others have forcefully refuted the eleven indriyas of the Sāṃkhya, then why have they not denied or mentioned the number of twenty-two indriyas⁴ which are well known in the Buddhist Abhidharma work.⁵ It is known that in the Buddhist

1. Buddhīndriyāṇि cakṣuhśrotraghṛāṇarasanasparśanakāni. Vākpāṇipādāpāyūpasthān karmendriyāṇyāhuḥ.—Sāṃkhyakārikā, 26.
2. Tātparyatīkā, p. 531; Nyāyamañjarī, p. 483.
3. Pañcendriyāṇि bhavanti, ārambho niyamārthaḥ ṣaḍādipratīṣedhārthāśca. TS., Bhā., p. 162; Sarvārthasiddhi, p. 174.
4. Dhātūnaṁ anantaram udditthāni pana, indriyāṇि ti bāvīsati indriyāṇi : cakkhundriyāṁ, sotindriyāṁ, ghāṇindriyāṁ, jihvindriyāṁ, kāyindriyāṁ, manindriyāṁ, itthindriyāṁ, purisindriyāṁ, jīvitindriyāṁ—sukhindriyāṁ dukkhindriyāṁ somanassindriyāṁ, domanassindriyāṁ, upekkhindriyāṁ, sadhindhriyāṁ, vīriyindriyāṁ, satindriyāṁ, samādhindhriyāṁ, paññindriyāṁ, anaññātaññassāmītindriyāṇi aññindriyāṁ aññātāvindriyāṁ ti.—VM.; XVI, 1.
5. Abhidharmakośa, Sphuṭārthā, 95; VM., XVI, 1. 2 ff., Darśana and Cintana, p. 137.

Abhidharma tradition there was a common custom of referring to every mānasaśakti (mental power) by the word 'indriya'. Having thought thus, they have not mentioned or refuted that tradition. Objects like sound, colour, smell, taste, touch, etc., are always apprehensible to the six sense-organs. In this regard all the systems of thought are of one view, but there is the difference of opinion of the Nyāya-Vaiśeṣika from all other systems of thought with regard to the apprehensibility of substance by the indriyas. All other philosophies, even having accepted indriyas as the apprehenders of quality, admit six sense-organs as the apprehenders of substance, while the Nyāya-Vaiśeṣika and the Pūrvamīmāṃsaka call eye, tactile organ (*sparśanendriya*) and mind as the only apprehenders of substance, but not others.¹ Ācārya Hemacandra has expressed this difference of opinion, having spoken of karma-bhāva-pradhānavutpatti of the words, such as, *sparśa* (touch), etc., and along with it he followed the previous Ācāryas.

The discussion on indriya-ekatva (singleness or oneness of sense-organ) and multiplicity of indriyas is very old in the metaphysical tradition.² Some, having accepted the sense-organ as one, has supported its many functions by its many sthānas (places), while all the advocates of the multiplicity of sense-organs maintained only the principle of multiplicity of sense-organs by refuting the view of singleness of the sense-organ. In regard to this Ācārya Hemacandra, having recourse to the method of the relative point of view, followed the old Jainācāryas by making a synthesis of both the theories, i. e. mutual singleness and multiplicity in sense-organs, and avoided the faults attributed to each other in the case of every extreme view.

Indriyas (sense-organs) are of two kinds, viz. Dravyendriya (physical sense-organ) and Bhāvendriya (psychic sense-

1. Muktāvalī, kā, 53-56.

2. Sthānānyatve nānātvādavayavinānāsthānatvācca saṁśayaḥ.

organ).¹ Dravyendriya, because of being produced from matter is non-living matter-like (physical), but Bhāvendriya is knowledge-like because it is the mode of Cetanasākti (capacity of consciousness).² Dravyendriya is produced by the rise of ḡopāṅga (limbs)—and nirmāṇanāmakarma (i. e. constitution-making nāmakarma)³. There are stated to be two divisions of it, viz. nirvṛtti and upakarana⁴ (accomplishment and means).

The name of the shape (or form), of sense-organs is nirvṛtti. It is also divided into two kinds, viz. bāhya (external) and ābhyanṭara (internal).⁵ The external shape or form of sense-organ is called bāhyanirvṛtti, while the name of the internal shape or form is ābhyanṭaranirvṛtti. The external part is just like the sword, while the internal part is like the sharpness of it which is made of very fine translucent atom. Both material and pysical natures of the internal nirvṛtti have been described. Upakarana is the means of nirvṛtti; it is also external and internal.⁶ In regard to the shape of sense-organs it should be noted that there are many kinds of shape of skin, but there is no difference in its external and internal shapes.

The internal shape of skin of any being is just like the

1. Dvividhāṇḍriyāṇi bhavanti—dravyendriyāṇi bhāvendriyāṇi ca—TS. Bhā., II, 16, p. 163.
2. Sāmānyataḥ dravyamayāṇi dravyātmakāni dravyendriyāṇi, bhāvendriyāṇi tu bhāvātmakānyātmapariṇatirūpāṇīti
— TS. Bhā., p. 164.
3. Ibid., p. 164.
4. Nirvṛttypakaraṇe dravyendriyam, TS., II. 17; Tatra nirvṛttīndriyamupakaraṇendriyam ca dvividham dravyendriyam.—TS. Bhā. II, 17.
5. Nirvṛttiraṅgopāṅganāmanirvartitāṇḍriyadvārāṇi, karma-viśeṣasāmūḍkṛtāḥ śārīrapradesāḥ, nirmāṇanānāṅgopāṅga-pratyayamūlaguṇāṇirvartanetyartāḥ. Ibid., p. 164.
6. TS, Pt. I, pp. 164, 165.

external shape of skin.¹ But in the case of other sense-organs it is not so. Except skin the internal shapes of all other sense-organs are not identical with their external shapes. The internal shapes of kindred sense-organs of all classes of animals have been accepted as of one and the same type. As for instance, the internal shape of the ear is like the shape of a kadamba-flower, that of the eye is like the lentil, that of the nose is like the atimuktaka flower, that of the tongue is like khurupā (dagger or weeding agricultural implement). The internal shape of the skin is of different kinds.²

The external shapes of all the sense-organs are different in all cases of animals, as for example, ears, eyes, noses and tongues of man, elephant, horse, cow, cat, rat, etc.³

All these five sense-organs are individually an innumerable part of an aṅgula (finger) by thickness (bāhalla), while the ear is an innumerable part by width (pohatta); thus upto that of the eye and nose; the tongue is one aṅgula (finger) by width (pohatta); and the skin is equal to the extent of the body. These five sense-organs are endowed with infinite units (anantapradeśikas) and immersed in countless space-points asamṛthyeyapradeśāvagāñhi). The least of all these is the eye.⁴

The capacity of apprehending objects by internal nirvṛtti (formation) is called upakaraṇendriya.⁵

Bhāvendriya (psychic sense-organ) is of two kinds, viz. labdhirūpa (mental faculty-like) and upayogarūpa (consciou-

1. TS., Pt. I, pp. 165.

2. Bhs., 2.4. 499; Prajñā, 15, 191; Pañcadaśa, Indriyapada, Prathama Uddeśaka; Fourth Karmagrantha, pp. 36-37; TS., ch. II, 17-18 and vṛtti; Viśeṣāva., gāthā, 2993-3003 and Lokaprakāśa, Sarga, 3, Sl. 464 ff.

3. TS., Pt. I, p. 165.

4. Paññā., 5, Indriyapada, appabahudāram, 191, p. 166.

5. TS., Pt. I, p. 164.

sness-like).¹ The kṣayopaśama of Matijñānāvaraṇa—the particular capacity of consciousness is called labdhirūpabhāvendriya. The pravṛtti (action) which takes place in the apprehension of objects by soul according to this labdhirūpabhāvendriya is called upayoga-rūpa bhāvendriya.²

According to the Buddhist philosophy, "The translucent matter of sense-organs (rūpaprasāda) is very subtle; it is like the shining of a jewel, it cannot be cut in two,³ it cannot be burnt,⁴ it has no weight,⁵ it disappears without a residue at death.⁶ It is nevertheless atomic, and is represented by five different kinds of atoms. The atoms of the organ of sight (cakṣurindriya) cover in concentric circles the eye ball. The atoms of the organ of taste, or more precisely that matter which is supposed to convey the sensation of taste, covers in concentric semicircles the tongue. The atoms of the organs of touch (kāyendriya) cover the whole body.⁷ The idea that all these different kinds of special matter are, indeed, the same translucent subtle stuff covering the whole body and disappearing at death had also its advocates, who consequently reduced all

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1. Labhyupayogau bhāvendriyam, TS., II. 18, p. 166.
 2. Labdhirūpayogastu bhāvendriyam bhavati, labdhirnāma gatijātyādināmakarmajanitā tadāvaraṇiyakarmakṣayopaśamajanitā ca, indriyāśrayakarmodayanirvṛttā ca jīvasya bhavati. TS. Bhā., p. 166.
 3. Chinatti chidyate caiva bhāyam dhātu catuṣṭayam Dahyate tulayatyevam vivādo daghṛtulyayoh. Abh. K. I.36, Tibetan Text, p. 63; Abh. K., I. 36, Yaś. Comm.
 4. Abh. K., I. 36, Tibetan Text, p. 36. 13.
 5. Ibid.
 6. Vipākajaupacayikāḥ pañcādhyātmaṁ vipākajāḥ Na śabdo apratighā astau naisyandika vipākajāḥ mṛtasvānanuvṛtteḥ; Abh. K., I.37. Yaśomittra.
 7. Tribhirghrāṇādibhistulyavisiyagrahaṇam matam. Caramasyāśrayo atītaḥ pañcānām sahajaśca taiḥ. Abh., K., I.44.

senses to one, the sense of touch, but this did not find general acceptance. Being as subtle as the shining of jewel, this matter cannot appear alone; it is supported by gross matter (mahā-bhūta) of which the eye ball and flesh in general consist.”¹

A comparative study of Indriyas by all Indian systems of thought in brief reveals that the Jaina view on them from their physical and psychic aspects is more subtle and thought-provoking as they have been accepted as representing translucent matter.

SECOND SECTION KARMA

All forces of life and Nature are associated together in the principle of cause and effect—the central theme of studies of all branches of knowledge. The fundamental law of causation pervades the entire sphere of physical and psychic worlds, governing the process of origination, continuity and decay of the substances—living and non-living, gross and fine, developed and undeveloped. A universal law of causation explains and interprets the psycho-physical actions and reactions of beings, which are manifested in the forms of thoughts, feeling and behaviour.

According to Jaina philosophy, soul is endowed with consciousness, infinite modes of knowledge, self-awareness, conduct, and of the attribute of neither heaviness nor lightness respectively, from the stand-point of condition in its perfect eternal state. But the worldly souls are imperfect, for their innate faculty is clouded by a very fine foreign element intangible to the senses which is called Karma and is an aggregate of material particles. This karma-pudgala (karmic matter), having entered into the mundane soul through the mental, vocal and bodily actions, causes certain conditions in it due to the modifications of consciousness comprising four passions, viz. anger, pride, deceitfulness and greed.

1. The Central Conception of Buddhism, p. 10-11.

NATURE OF KARMA-PUDGALA (KARMIC MATTER)

The common meaning of the word 'Karma' is action and this meaning of its come across in the Vedic tradition from the Vedic age up to the Brahmanic period. In this tradition naimittika kriyās (occasional ceremonies) of day-to-day life, such as, sacrifice, etc., have been called Karma. It was admitted that the performance of these actions was made in order to please the gods so that they would fulfil the desire of the performer.¹ The meaning of Karma as action is accepted in the Jaina tradition, but the Jainas do not admit only this meaning as it is pointed out. Each and every activity of the worldly beings or desire is infact Karma, but in the Jaina tradition it is called Bhāvakarma. The non-living material substance which makes soul in bondage, having come into contact with it, due to that Bhāvakarma (i. e. action of soul) is called Dravyakarma.² It is Pudgaladravya (material substance); its appellation of Karma (karmasamjñā) is analogical (aupacārīka), for it is the activity of soul or it is produced by its action, hence it is also called Karma. Here upacāra (analogy) of the cause is made to be in the effect. That is, according to the Jaina definition, there are stated to be two kinds of Karma, viz. Bhāvakarma and Dravyakarma.³ The activity of Soul is Bhāvakarma and its effect is Dravyakarma. There exists a relation of cause and effect between these two Karmas; Bhāvakarma is a cause and Dravyakarma is an effect. But this cause-effect relation is similar to the cause-effect relation of the hen and its egg. Egg is produced from the hen, hence it is a cause and the egg is an effect. It is true, but the hen also is born of the egg.⁴ Therefore, there is the cause-effect relation.

1. Mīmāṃsā, 2. 1. 5.

2. Kammattāṇeṇa ekkām dāvvaṁ bhavetti hodi duvihaṁ tu
Poggalapiṇḍām dāvvaṁ tassati bhāvakammaṁ tu—śat.,
Vol. 15.6.

3. Ibid.

4. Aṁḍae pacchā kukkuḍī puvvīṁ kukkuḍī pacchā aṁḍae,
Rohā ! see nāṁ aṁḍae kao ? Bhagayāṁ, kukkuḍio sā... nāṁ

in both of them. But it cannot be said which is the first or prior. From the point of view of santati (continuity) their cause-effect relation is beginningless. Similarly, Dravyakarma is produced from Bhāvakarma, so Bhāvakarma is accepted as a cause and Dravyakarma as an effect. But the consumption (niṣpatti) of Bhāvakarma does not take place in the absence of Dravyakarma. Therefore, Dravyakarma is a cause of Bhāvakarma and Dravyakarma exists like the relation between the hen and its egg from the point of view of continuity (santati). Although the cause-effect relation of Bhāvakarma and Dravyakarma is beginningless from the stand-point of continuity; nevertheless, it is known from individual consideration that the cause of some one Dravyakarma will be some one Bhāvakarma; therefore, the relation of priority and posteriority between them can be determined, for one Bhāvakarma from which one particular Dravyakarma is produced is the cause of this Dravyakarma and this Dravyakarma is the effect of that Bhāvakarma, but not the cause. Similarly, it is to be admitted that even there being individually prior and posterior states, both of them are beginningless from the point of view of class because of there being the absence of pūrvāparabhāva (prior and posterior states).

It is evidently clear that Dravyakarma is born of Bhāvakarma, because Soul becomes in the bondage of Dravyakarma only due to its transformations like attachment, aversion and delusion, i. e. it travels in the world without attaining liberation. The reason why has Dravyakarma been accepted as the cause in the production of Bhāvakarma is this that if the production of Bhāvakarma is possible in the absence of Dravyakarma, there will be the emergence of Bhāvakarma in the liberated souls and again they will have to come down to this human world. Moreover, there will be no difference between the world and liberation. It will have to be accepted that there

kukkaḍī kao ? Bharante ! amḍayāo evāmeva Rohā ! se ya
amḍae sā ya kukkuḍī. puvvimpeṭe pacchāpeṭe duvete
sāsayā bhāvā, anānupuvvī esā Rohā—Bhsa., 1. 6. 53.

is the capacity in the liberated soul, to be in bondage, just as it is the case with the worldly soul. In such a condition no man will strive for attaining liberation. Therefore, it must be admitted that there is no Bhāvavakarma in the liberated soul because of the absence of Dravyakarma in it. And there takes place the emergence of Bhāvavakarma in the worldly soul on account of there being Dravyakarma. In this way, the worldly life is beginningless for the soul owing to the cause of origination of Dravyakarma from Bhāvavakarma and that of Bhāvavakarma from Dravyakarma since the beginningless time.

The emergence of Dravyakarma takes place from Bhāvavakarma; therefore, Dravyakarma is the effect of Bhāvavakarma; such is the relation of cause and effect. Just as the lump of earth which changes into the form of a jar is the material cause, but it cannot become jar in the absence of a potter, even though there is the capacity in it to become a jar, therefore, the potter is the efficient cause, just so there is the capacity in Pudgala (Matter) to undergo transformation into the form of Karma, hence it is the material cause. But the material substance (Pudgaladravya) cannot change into the form of Karma until there is no existence of Bhāvavakarma in Soul. For this reason Bhāvavakarma is the efficient cause. Similarly, Dravyakarma also is the efficient cause of Bhāvavakarma. That is to say, the cause-effect relation of Dravyakarma and Bhāvavakarma is nimittanaimittikarūpa (occasion-occasionedlike), for not becoming upādānā-upādeyarūpa (material cause and effect caused by it).¹

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1. For example, (1) A is the Upādāna-kāraṇa of B.
 - (2) B is the upādeya of A.
 - (3) B is the upādāna of C.
 - (4) C is the upādeya of B.

Three stages are involved in the process of matter which aggregates in the material world, e. g. water-karma-fire. Similarly, three stages of mind are involved in the mental world : (1) thought of being harmed, (2) anger and (3) thought of harming. If the earlier stage of mind causes a

The pravṛtti (activity) of the worldly soul is called Bhāvākarma; the four internal transformation of the soul, viz. anger, pride, deceitfulness and greed are called Bhāvākarma or the internal transformations of it, viz. attachment, aversion and delusion are Bhavākarma. The worldly soul is constantly associated with the body, so its activity is not possible without the support (base) of mind, speech and body. The emergence of the internal transformations like the four passions, or attachment, aversion and delusion of the soul takes place by the activities of mind, speech and body. In other words, it can be said that the mental, vocal and bodily activities of the worldly soul which are also called yoga (activity) are tinged with the colour of attachment, aversion and delusion or four passions (kaṣāyas). In fact, pravṛtti (activity) is one, but just as a piece of cloth and its colour are called different, just so there are also two names of this pravṛtti of soul, viz. yoga (activity) and kaṣayā (passion). Just as a new piece of cloth devoid of colour is of one colour, just so the pravṛtti of mind, speech and body free from the colour of passion is of one colour. Just as the colour of a piece of cloth is sometimes light and some-

later stage of mind, the former is upādāna and the latter is upādeya. If the earlier stage of matter causes a later stage of matter, the former is upādāna and the latter is upādeya. e. g. water particle, Karma-particle, earth particle.

Nimitta : If a stage of mind cause a state (stage) of matter or vice versa, then the cause is nimitta and the effect is naimittika.

- e. g. 1. Cause—anger (mental stage), effect :—Karma particle, becoming earth particle (material stage).
2. Cause —Water particle becoming karma-particle (material happening)
3. Effect —anger (mental happening).

That is to say, when the like causes the like, it is upādāna-upādeya, when the unlike causes the unlike, it is nimitta-naimittika.

times deep, just so this Bhāvakarma is sometimes intense and sometimes mild in the presence of the colour of passion with the operation of activity (yogavyāpāra); just as a piece of cloth devoid of colour can be small or large, just so the activity free from passion can also becomes more or less. But there becomes the absense of intensity of mildness (mandatā) of luminosity, being the cause of colour. For this reason, the importance of colour-communicating passion is more with regard to activity. Therefore, only passion is called Bhāvakarma. In the binding of Dravyakarma both activity and passion¹ have usually been accepted as the efficient cause, still this is the reason of accepting only passion as Bhāvakarma. In a nutshell, the four passions (kaśayas)—anger, pride, deceitfulness and greed or the faults—attachment, aversion and delusion² are Bhāvakarma. Soul becomes bound by receiving Dravyakarma from them.

1. Joga payadipaesaṁ ṭhii aṇubhāgaṁ kasāyāu—Pañcamakarmagrantha, Gāthā, 96; Bhs. 9. 33. 385.
2. Rāgo ya doso vi ya kammabīyam, kammaṁ ca mohappabhavaṁ vayaṁti, kammaṁ ca jālmarañassa mūlam, dukham ca jālmarañam vayaṁti—Uttarā., 32. 7; Carittamohanām kammaṁ, duvihām tu viyāhiyam Kasāyamohanājjīvaḥ karmaṇo yogyān pudgalānādatte; Ts., VIII, 2; Dohi ṭhānehimi āyā ahe logam jāṇai pāsai, tam samohaenam ceva appaṇenam āyā ahe logam jāṇai pāsai, asamohaenam ceva appaṇenam āyā ahe logam jāṇai pāsai, adhohi samohayā samohaenam ceva appaṇenam āyā ahe logam jāṇai pāsai—Sthānāṅga Sūtra, 2. 2. 114; Micchattam puna duvihām jīvamajīvam taheva aṇṇānam. Aviradi jogo moho kodhādiyā ime bhāvā—Samayasāra 94; Uvaogassa aṇṇai pariṇāmā tinni mohajuttassa Micchattam aṇṇānam aviradi bhāvo ya ḥādavvo—Ibid. 96; Jam bhāvam suhamasuham karedi ādā sa tassa khalu kattā Tam tassa hodi kammaṁ so tassa du vedagā appā—Ibid. 109;

The Nyāya-Vaiśeṣika view on Karma

Other Indian systems of thought have admitted this doctrine of Karma by different appellations. The Naiyāyikas have accepted the three vices of faults, viz. rāga (attachment), dvesa (aversion) and moha (delusion). The pravṛtti (activity) of mind, speech and body of beings takes place on receipt of the impulse from these vices. Merit and demerit or virtue and vice (dharma and adharma) originate from this pravṛtti. Dharma and Adharma (merit and demerit) have been called by the Naiyāyikas as Saṃskāras (forces).¹

These three faults—rāga (attachment), dvesa (aversion) and moha (delusion) as mentioned in the Nyāya are accepted by Jaina philosophy as Bhāvakarma by name. That which is called by the Naiyāyikas as pravṛtti produced from doṣa is named as yoga (activity) in Jaina metaphysics. The Naiyāyikas have attributed the name 'Saṃskāra' (force) or Adṛṣṭa (unseen force) to dharma and adharma (merit and demerit) born of pravṛtti (activity); that is the place of Paudgalika-Karma or Dravyakarma in Jaina philosophy. In the Nyāya view Saṃskāra like dharmādharmā is the quality of Soul. But it should be noted that only Soul is conscious because of there being the difference between quality and its substratum according to this view, its quality cannot be called conscious, for there is no inhering relation of consciousness in Saṃskāra (force). The Jaina Dravyakarma also is non-conscious, there-

Cahuvīha aneyabheyam bāmīdhate nāṇadāmīsaṇagūṇebim
Samaye samaye jamhā tena avāmīdhutti nāṇī du, Samayasara
177, Moheṇa vā rāgeṇa vā doseṇa va pariṇadassa jīvassa
Jāyadi viviho bāmīdhō tamhā te saṃkhavaidavvā.

—Pravacanasāra. 1. 84;

Jo moharāgadose nihānadi uvaladdha joṇhamuvadesam
so savvadukkhamokkhāt pāvadi acireṇa kāleṇa, Ibid. 1.88.

1. NBhā., 1. 1. 2; NS., 4. 1. 3, 17;

Evaṁ ca kṣaṇabhaṇgitvāt saṃskāradvārikāḥ sthitāḥ sa kar-
majanyasaṃskāro dharmādharmajirocyate, NM., p. 472;
see also NM., pp. 471, 500, etc; see PPBhā, about pravṛtti.

fore, both Saṃskāra and Dravyakarma, as they may be called, are non-conscious. In both the views the difference is this that according to the Naiyāyikas, Saṃskāra is a quality of Soul, while Dravyakarma of the Jainas is Pudgaladravya (material substance). On deep consideration this difference also appears to be negligible. The Jainas accept this proposition that Dravyakarma originates from Bhāvavakarma, the Naiyāyikas also admit the origination of Saṃskāra. The real significance of the postulation that Bhāvavakarma has produced Dravyakarma is this that Bhāvavakarma has made some such Saṃskāra as a result of which Pudgaladravya has been changed into the form of Karma. Like this the particular Saṃskāra which took place in Pudgala (Matter) due to Bhāvavakarma is real Karma, according to the Jaina view. This Saṃskāra (impression or force) is non-different from Pudgaladravya, therefore, it is called Pudgala. Under such conditions there does not exist any particular difference between Saṃskāra of the Naiyāyikas and Dravyakarma of the Jainas.

The Jainas accept the subtle body called 'kārmaṇa-śarīra' also over and above the gross body. There takes place the birth of the gross body because of this karmic body. The Naiyāyikas call 'kārmaṇa-śarīra' as avyakta-śarīra' (unmanifest-body)¹. The Jainas accept it to be intangible to the sense; for this reason, it is really unmanifest. It appears here that the thought on liberation came later on.

The Vaiśeṣika conception of Karma is identical with that of the Nyāya. Adṛṣṭa (unseen force) is one of the twenty four qualities as propounded by Praśastapāda. This quality is different² from Saṃskāra-guṇa (quality of force). It has been

1. NV., 3. 2. 68.

2. Guṇāśca rūparasagandhasparśasamkhyāparimāṇapṛthaktva-samyogavibhāgaparatvāparatvabuddhisukhaduhkheccchā-dveṣaprayatnāśceti kaṇṭhoktāḥ saptadaśa / ca śabdasaṃucitāśca gurutvadravatvasnehaśaṃskārādṛṣṭaśabdāḥ saptaivetyevaṁ caturviṁśati guṇāḥ—PPBhā., p. 3 and pp. 637, 643.

divided into two kinds, viz. dharma and adharma (merit and demerit). It is known by this that Praśastapāda has made mention of dharma and adharma by the word 'Adṛṣṭa' instead of the word 'Saṃskāra'. From this fact only the difference of name should be understood, without having accepted the difference of postulation, for Praśastapāda has accepted 'Adṛṣṭa' as the quality of Soul, as much as equal to 'Saṃskāra' of the Naiyāyikas. In the Nyāya-Vaiśeṣika philosophy this tradition of the origination of Saṃskāra from doṣa (fault), birth from Saṃskāra (force), doṣa (fault) from birth and again Saṃskāra (force) from doṣa (fault) has been regarded as beginningless like the seed and the sprout. This is just like the aforesaid beginningless tradition of Bhāvakarma and Dravyakarma of the Jainas.¹

THE SĀMKHYA-YOGA VIEW ON KARMA

There is very much sameness of the doctrine of Karma of the Yoga philosophy with the doctrine of Karma of Jaina metaphysics. According to the Yoga, avidyā (ignorance), asmitā (egoism), rāga (attachment), dveṣa (aversion) and abhiniveṣa (affection) are the five kleśas (afflictions).² Due to them there takes place (i. e. originates) the tenacity of mundane existence—the activity of mind (vṛtti) and from it there are produced Saṃskāras (forces) like dharma and adharma (merit and demerit); kleśa (affliction) can be equated with Bhāvakarma, vṛtti with yoga and Saṃskāra with Dravyakarma.

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1. Nanvevamapyavidyāparikalpita'eṣa brahmajīvātmavibhāgah,.....kasyaiṣa doṣa yadi cānādityamasya parihāro bījāṅkuravadbhaviṣyatī, bhavadbhirapi cānyamanādireva saṃsāro abhyupagataḥ avidyaiva ca saṃsāra ityucyate—NM., p. 513/95.
 2. Avidyā asmitārāgadveṣābhiniveṣāḥ pañca kleśāḥ—Yogasūtra, 2. 3.

In the Yoga philosophy Samskāra is called Vāsanā (desire), karma (action), and apūrva (energy) also. Moreover, in this view the cause-effect relation of kleśa and karma has been accepted as beginningless¹ like the seed and the sprout as much equal to Bhāvakarma and Dravyakarma of Jaina metaphysics.

In regard to the doctrine of Karma the difference between the Jaina and Yoga views is this that according to the latter, the relation of all these, kleśas (afflictions), kliṣṭavṛtti (afflicted activity) and Saṃskāra (force) is not with Soul, but rather with citta (mind) or antaḥkaraṇa (internal sense-organ) and this antaḥkaraṇa is the modification of Prakṛti. According to the Jaina view, there is the relation of the material karmic body with Soul due to the dispositions—moha (delusion), rāga (attachment) and dveṣa (aversion), since a beginningless time there exists a relation of cause-effect (kārya-kāraṇa) between bhāvas (dispositions) and the kārmaṇaśarīra (karmic body) like the seed and the sprout. In the origination of one, the other exists as cause; nevertheless, both of them are in association with Soul from a beginningless time. It is impossible to determine which is the first between them.

Similarly, in the Sāṃkhya view, the subtle body (liṅgaśarīra) is in association with Puruṣa (self) from the beginningless time. The subtle body (liṅgaśarīra) originates from the dispositions (bhāva) like rāga (attachment), dveṣa (aversion) and moha (delusion) and there is also a cause-effect relation between the dispositions and the subtle body like the seed and the sprout.² Just as the Jainas accept the gross body as

1. Vṛttayah pañcayah kliṣṭakliṣṭāḥ—Yoga, I, 5; Yogabhāṣya, 1. 5; Ibid., 2. 3.

Tatra puṇyāpuṇyakarmāśayah
kāmalobhamohakrodhaprasvah ”...etc., Ibid., 2. 12.

Satsu kleśeṣu karmāśayo vipākārambhī bhavati,
nocchinnakleśamūlah I”, Ibid., 2. 13. etc.

See also their Tattvavaiśāradī, Bhāsvatī, etc., commentaries.

2. Māṭharavṛtti, 52; Tattvakaumudī vyākhyā, 52.

separate and distinct from the karmic body, so the Sāṃkhya also accepts the subtle body as different from the gross body.¹ In the Jaina view both the gross and fine bodies are material; in the Sāṃkhya view also these two are Prākṛtic (of primordial Matter). The Jainas, having accepted both the bodies as the modifications of Matter even, regard the classes of both as different. According to the Sāṃkhya, the one is tanmātric (infra-atomic) and the other is born of parents. In the Jaina view, the gross body becomes separate at the time of death and a new body is produced at the time of birth. But the karmic body goes along with Soul from one place to another place of birth at the time of death and thus it exists. The Sāṃkhya also postulates that the gross body born of parents does not remain with the self at the time of death and a new body is produced on the occasion of the next birth. But the liṅgaśarīra (subtle body) exists as permanent and moves from one place to another.² According to the Jaina system of thought the karmic body associated with Soul since a beginningless time ceases to be at the time of liberation. Similarly, it is maintained in the Sāṃkhya that there takes place the cessation of the liṅgaśarīra (subtle body).³ In the Jaina view kārmāṇyaśarīra and dispositions (bhāvas) like rāga (attachment), dveṣa (aversion), etc., remain with Soul from a beginningless time; without the one there is no existence of the other. Like this, in the Sāṃkhya view the liṅgaśarīra also does not exist without dispositions and vice versa.⁴ According to the Jaina view, kārmāṇyaśarīra is non-

1. Sūkṣmā mātāpitṛjāḥ saha prabhūtastridhā viśeṣāḥ syuḥ
Sūkṣmāsteśāṁ niyatā mātāpitṛjā nivartante—
Sāṃkhyaśāstra, 39
2. Māṭharakārikā, 44, 40; Yogadarśana, 2. 13; Bhāsvatī's commentary; Sāṃkhyaśāstra, 40.
3. Liṅgam pralayakāle pradhāne layam gacchatī iti liṅgam—Māṭharavṛtti, 40
4. Citram yathāśrayamṛte sthāṇvādibhyo yathā vinā chāyā Tadvadvinā Rviśeṣaiḥ na tiṣṭhati nirāśrayam liṅgam—Sāṃkhyaśāstra, 41.

resisting (*aghāta*) or unimpeded; the Sāṃkhya also maintains that the liṅgaśarīra is endowed with unimpeded motion; it is not to face any resistance.¹ In the Jaina view there is no capacity of enjoyment in kārmaṇaśarīra but the gross body enjoys by the senses. Similarly, in the Sāṃkhya view also the liṅgaśarīra is devoid of the capacity of enjoyment.²

Although according to the Sāṃkhya view, the dispositions like rāga, etc., are the modifications of Prakṛti (Primordial Matter), liṅgaśarīra also is the modification of Prakṛti, and the other material objects are as such, even then the Sāṃkhya does not deny the categorical divisions existing in all these modifications. It accepts three kinds of sarga (creation), viz. pratyayasarga (evolution or creation of intellect), tanmātric sarga (infra-atomic creation) and bhautika-sarga (material evolution or creation).³ The dispositions, such as, rāga, dvesa, etc., are included in the pratyayasarga⁴ and the subtle body is in the tanmātric sarga (infra-atomic creation or evolution of rudimentary elements).⁵ Similarly, in the Jaina view the dispositions like rāga, etc., are produced from matter; and so also is the case with the kārmic body. But the basic difference between these two views is that the material cause of dispositions is Soul and the efficient cause of them is Matter, while the material cause of the kārmic body is Matter and the efficient cause is Soul.

1. Pūrvotpannamasaktam nityam mahadādisūkṣmaparyantam
Saṃsarati nirūpabhogam bhāvairadhivāsitam liṅgam
—Sāṃkhyaśārikā, 40.
2. Ibid.
3. Tattvakaumudi, 52, 53.
4. Eṣa pratyayasargo viparyayāśaktitusṭisiddhyākhyah
Guṇavaiśamyavimardāttasya bhedāstu pañcāśat, SK. 46.
5. Na vinā bhāvairliṅgam, na vinā liṅgena bhāvanirvṛttiḥ
Liṅgākhyo bhāvākhyastasmād-dvividhaḥ pravartate
sargah, SK., 52;
Na vinā iti liṅgam iti tanmātrasargamupalakṣayati
bhāvaiḥ iti ca pratyayasargaiḥ, Ibid. (comm.)

In the Sāṃkhya view, Prakṛti, even being non-sentient, behaves like the sentient principle due to its association with Puruṣa (Self).¹ Similarly, in the Jaina view Pudgaladravya (material substance), even being non-living, behaves like the living principle, when it undergoes modification into the form of Karma by its association with Soul. The Jainas have admitted the union of the worldly soul and the non-living objects, such as, body, etc., like the union of milk and water. In the same manner the Sāṃkhya accepts the union of Puruṣa (Self) and the non-living object, such as, body, senses, intellect, etc., like the union of milk and water.²

Bhāvakarma of Jaina philosophy compares well with bhāva (disposition)³ of the Sāṃkhya and Vṛtti⁴ of the Yoga, and Dravyakarma or kārmaṇaśarīra with the liṅga-śarīra of the Sāṃkhya. Both the Jaina and Sāṃkhya systems of thought do not admit any such cause as God in karmaphala (fruition of action) and karmaniṣṭatti (consumption or performance of action). According to Jaina philosophy, Soul is not really the forms—man, animal, god, infernal being, etc., but the soul-supported karmic body, having gone to different places of birth, builds up the forms of beings, such as, man, god, infernal

1. Māṭharavṛtti, pp. 9, 13, 33.

2. Asti puruṣah saṃghātapaṛārthatvāt yataḥ saṃghātaśca paṛārthaḥ tasmāt hetoh iha loke ye saṃghātāste paṛārthā dṛṣṭāḥ paryākarathaśaraṇādayaḥ evam gātrāṇām mahadā-dinām saṃghātaḥ samudāya paṛārtha eva, etc., Māṭhara-vṛtti, 17, p. 29.

3. Sāṃkhyakārikā, 40.

4. Rūpādiṣu pañcanāmālocanamātramiṣyate vṛttih
vacanādānayiharaṇotsargānandāśca pañcānām, 28
Svālakṣaṇyām vṛttistrayasya saisā bhavatyasāmānyā
Sāmānyakaraṇavṛttih prāṇādyā vāyavaḥ pañca, 29
Yugapaccatuṣṭayasya tu vṛttih kramaśca tasya nidriṣṭā
Drṣṭe tathāpyadṛṣṭe trayasya tatpūrvikā vṛttih—
Ibid 30

being, etc. In the Sāṃkhya view also the liṅgaśarīra being Soul-supported (puruṣādhishṭhita), makes bhūtasarga (material evolution or creation), such as, man, god, lower animals, etc.²

THE BUDDHIST VIEW ON THE NATURE OF KARMA

As in Jaina metaphysics, so in the Buddhist philosophy also it has been accepted that the multifariousness of beings is caused by Karma (action).³ Like the Jainas the Buddhists also admit lobha (rāga=greed-attachment), dveṣa (aversion) and moha (delusion) as the cause of the production of Karma. The being, having been associated with attachment, aversion and delusion, makes mental, vocal and bodily activities and generates attachment, hatred and delusion respectively. Thus the wheel of the world is moving on,⁴ there is no beginning time of this wheel; it is beginningless.⁴ In reply to the question of King Milinda on the location of the existence of Karma (action) Ācārya Nāgasena has explained that it cannot be shown where does Karma exist.⁵ In the Visuddhimagga Karma has been called arūpī (non-corporeal),⁶ but in the Abhidharmakośa as Avijñapti, i. e. Karma has been described as rūpa (Matter),⁷ and this rūpa (Matter) is apratigha (non-

1. Māṭharakārikā, 40, 44, 53.

2. Bhāsitām petām Mahārāja ! Bhagavatā kammassakā māṇava, sattā, kammaḍāyādā, kammayonī kammabandhū, kammaṭaṭisaraṇā, kammām satte vibhajati, yadidam hīnapaṇṭitatāyāti, Milindapañho—, 3. 2;
Karmajaṁ lokavaicitryaṁ—Abh. K., 4. 1.

3. Aṅguttaranikāya, Tikanipāta Sūtra, 33. 1, Bhāga, 1, p. 134.

4. Saṃyuttanikāya, 15. 5. 6 (Bhāga 2, pp. 181-2)

5. Na sakkā Mahārāja ! tāni kammāṇī dessetuṁ idha vā idha iva tāni kammāṇī titthantī—Milindapañho, 3, 15, p. 75.

6. Ninth Oriental Conference, p. 620

7. Abhidharmakośa, K., 1, 11.

resisting or penetrable) but not *sapratiṣṭha* (resisting or impenetrable). In the Sautrāntika view, *samāveśa* (inclusion) of Karma is made in *arūpa* (non-matter); it does not accept *Avijñapti* (unmanifested matter). From this it is known that like the Jainas the Buddhists also admit Karma as subtle (*sūkṣma*). Mental, vocal and physical activities also are called Karma. But they are *vijñaptirūpa* (instimation-like) or perceptible. That is, here the meaning of Karma is not only perceptible activity, but also is *Saṃskāra* (force) born of perceptible action. In the Buddhist definition it is called *Vāsanā* and *Avijñapti*. *Saṃskāra* produced by mental activity is called *Vāsanā* (desire) and *saṃskāra-karma* produced by vocal and physical activities is *Avijñapti* (unmanifested matter).¹

If compared, it can be said that the causative attachment, aversion and delusion of Karma of the Buddhists are *Bhāvaka*-karma of the Jainas. The perceptible action of mind, speech and body is *yoga* (activity) of Jaina philosophy and *Vāsanā* born of this perceptible action and *Avijñapti* are *Dravyakarma*.

The *Vijñānavādin* Buddhists determine Karma by the word '*Vāsanā*'. *Prajñākara* opines that whatever *kāryas* (effects or actions) are there, all of them are born of *Vāsanā* (desire). It is the root of all these, whether God or Karma, *Prakṛti* or anything else. Having accepted just God, if the production of the varieties of the universe is caused, even then it would not do without admitting *Vāsanā*. That is to say, the currents of all these rivers like God, *Prakṛti* and Karma become one by uniting into the sea of *Vāsanā*.²

1. *Abhidharmakośa*, 4; Keith's Buddhist Philosophy, p. 203.

2. *Kāryatvāt* sakalam kāryam vāsanābalasambhavam
Kumbhakārādikāryam vā svapnadarśanakāryavat.
PradhānamIśvaraḥ karma yadanyadapi kalpyate
*Vāsanāsaṅgasam*mūdhacetaḥ prasyanda eva saḥ.
Pradhānānām pradhānām tad-Iśvarānām tathesvarām
Sarvasya jagataḥ kartri devatā vāsanā parā. ;
Aśakyamanyathā kartumatra śaktih katham mata
Vāsanābalataḥ so'pi tasmādevam pravartate

In the view of the Śūnyavādins the other name of Māyā (Illusion) or Anādi Avidyā (Beginningless Ignorance) is Vāsanā.¹ In the Vedantic view also the cause of multifariousness of the universe is the beginningless Ignorance or Illusion.²

THE MIMĀMSAKA VIEW ON THE NATURE OF KARMA

The Mīmāṃsakas admit the existence of an entity named Apūrva³ which is born of actions like sacrifices, etc. Their argument is this that whatever performance is made by man becomes momentary because of its being action-like. Hence

Iti pradhāneśvarakartṛvādānadyah sadā śīghravahāḥ
pravṛttāḥ Viśantya evādvayataṁ prayānti tadvāsanāmey
a samudrameva, Pramāṇavārtikālaṅkāra,

A. M., 4, p. 75;

Vide, Nyāyāvatāravārtika-Vṛtti, pp. 177-8, Tippān.

1. Sarvajñasyeśvarasyātmabhūte ivāvidyākalpite nāmarūpe tattvānyatvābh्यामनिर्वाचनीये sarīṣāraprapāñcabījabhūte sarvajñasveśvarasyābhilapyete, tābh्यामanyaḥ sarvajñāḥ Iśvaraḥ—SBhā., 2. 1. 14.
2. Tadevam avidyātmakopādhiparicchedāpeksamevesvarasyeśvaratvam, sarvajñatvam sarvaśaktimattvam ca, na paramārthato vidyāpāśṭasarovopādhisvarūpe ātmansītisitavyasarvajñatvādivyayahāra upapadyate, SBhā., 2. 1. 14.
3. Apūrva punarasti yata ārambhāḥ śisyate “Svargakāmo yajeteti” itarathā hi vidhānamanarthakām syāt, bhangitvāt yāgasya yadyanyadanutpādyā yāgo vinaśyet phalamasati nimitte na syāt tasmādutpādayatIti, Sābara Bhāṣya, 2. 1. 5; Phalāya vihitāṁ karma kṣaṇikāṁ cirabhāvine
Tatsiddhirnānyathetyevamapūrvam pratigamyate—
Tantravārtika, 2. 1. 5;
Evam—yāgāderapūrvasvargādisādhanasāktikalpanamūhantyam—Sāstradipika, p. 80;
Vide Nyāyāvatāravārtika-vṛtti, p. 179.

there takes place the birth of an entity called 'Apūrva' out of that performance, which gives the fruit of actions like sacrifice, etc. Kumārila, while explaining this entity—Apūrva, said that the meaning of Apūrva is capacity. Both the actions, such as, sacrifice, etc., and Puruṣa are incapable of producing the heaven-like fruit until the performance of actions like sacrifices, etc., is not made. But after the performance there is born such a capacity by which the doer attains the heaven-like fruit. In this regard an eagerness should not be made to know whether this capacity is of Puruṣa or of the sacrifice. This much is sufficient to know that it is born.¹ That which is called by other philosophers as Saṃskāra (force), capacity, capability and power is expressed by the Mīmāṃsakas with the application of the word 'Apūrvā'. But they accept this view certainly that the emergence of Saṃskāra or Śakti (capacity or power) which takes place from Karma as laid down in the Vedas should be called Apūrva, but Saṃskāra born of other Karma is not Apūrva.²

The Mīmāṃsakas also maintain³ that the substratum (or abode) of Apūrva is Soul and Apūrva also is non-corporeal like Soul.⁴ This Apūrva of the Mīmāṃsakas can be compared with Bhāvavarma of the Jainas from this point of view that both of them are non-corporeal.⁵ Bhāvavarma, even being born of Dravyakarma, is the character of Soul. Just as the Mīmāṃsakas have accepted action as non-different from Soul,

1. Karmabhyah prāg yogasya karmaṇah puruṣasya vā
Yogyatā śastragamyā yā parā sā apūrvamisaye—
Tantravārtika, 2. 1. 5.

2. Yadi hi anāhitasaṃskārā eva yāgā naśeyuh,
Tantravārtika, p. 396.

3. Ibid., p. 398; Kriyātmoratyantabhedābhāvāt,
Śāstradīpikā, p. 80;

Yadi śvasamavetaiva ṣaktirisyeta karmaṇām tadvināśo tato
na syāt kartṛsthā tu na naśyati, Ibid.

4. Tantravārtika, p. 398.

5. Nyāyāvatāravārtika, Tippān, p. 781.

just so the Jainas also have accepted Dravyakarma somehow non-different; just as the Mīmāṃsakas regard Apūrva as being born of karma, just so the Jainas also admit Bhāvavakarma as being born of Dravyakarma; just as the Mīmāṃsakas accept Apūrva as capable of producing fruit, just so the Jainas accept Bhāvavakarma as the producer of particular fruit.¹

But, in fact, Apūrva is in the place of Dravyakarma of the Jainas. The Mīmāṃsakas accept the following order : Karma (action like sacrifices, etc.) is produced from kāmanā (desire) and Apūrva is born of pravṛtti (action), such as, sacrifices, etc. Hence kāmanā or tṛṣṇā (thirst) can be called Bhāvavakarma, pravṛtti like sacrifice, etc., as yoga (activity) of the Jainas, and Apūrva as Dravyakarma respectively. Moreover, according to the Mīmāṃsakas, Apūrva is an independent entity. So it seems proper that Apūrva should be accepted in the place of Dravyakarma. Although Dravyakarma is not non-corporeal; nevertheless, it is intangible to the senses just as Apūrva is.

Kumārila also does not make any earnestness in regard to this Apūrva. He has supported it in order to prove the fruit of sacrifice, but he himself has caused the production of the fruit of action without Apūrva. He says that the fruit is produced by action as subtle power or capacity. The production of any effect does not take place all of a sudden. But it becomes manifest as gross form, after becoming finest, finer and fine as power or capacity. Just as curd is not formed instantly on the mixture of acidic thing in milk, but it becomes manifest clearly as curd at particular time, having passed through the stages of many kinds of fine forms, just so the fruits of sacrificial actions, such as, heaven, etc., being born in subtle form, become manifest as gross from on the cooking (maturity) of time later on.²

1. Kriyātmanoratyantabhedābhāvāt—Sāstcadīpikā, p. 80.

2. Yāgādeva phalaṁ taddhi śaktidvāreṇa siddhyati sūkṣmaśa-ktyātmakam vā tat phalamevopajāyate—

Tantravārtika, p. 395, Vide Nyāyāvatārvārtika
vṛtti, p. 181.

Ācārya Śaṅkara has refuted the conception of this Apūrva of the Mīmāṃsakas or the conception of subtle power or capacity and has proved this thing that God gives the fruit according to action. He has supported the view that the attainment of fruit is not possible from action but from God.¹

The gist of the above discussion on the nature of Karma is this that there is no objection of any philosopher in regard to Bhāvav karma. In the opinion of all philosophers rāga (attachment), dveṣa (aversion) and moha (delusion) as Bhāvav karma or they are the causes of Karma. That which is called Dravyakarma by the Jainas is called Karma by other philosophers. Saṃskāra (force or impression), Vāsanā (desire), Avijñapti (unmanifested matter), Māyā (illusion) and Apūrva (energy) are the different names of it. It has been observed that there is no particular dispute with regard to the entity, although there is the difference of opinions of the philosophers on this point whether Karma is material substance or quality or essential character (dharma) or any other independent substance.²

Kinds of Karma

The divisions of Karma into puṇya and pāpa (virtue and vice), kuśala and akuśala (good and bad), śubha and aśubha (auspicious and inauspicious), dharma and adharma (merit and demerit) are acceptable to all Indian systems of thought. At the initial stage of speculation about Karma there appears to be two divisions of it, viz. puṇya and pāpa (virtue and vice) or śubha and aśubha (auspicious and inauspicious).³ All Indian systems of thought have accepted these two kinds of Karma—puṇya and pāpa as bondage and determined their respective

1. SBhā. on BS., 3. 2. 38-41.

2. Ātmamīmāṃsā, Sri Dalsukh Malvania, pp. 95-110

3. Bṛhadāraṇyaka, 3. 1. 13; Praśnopaniṣad, 3.7; Pañcamakar-magrantha from 15; TS., 8. 21; Sāṃkhyakārikā 44; Visuddhimagga, 17. 88; Yogasūtra, 2. 14; Yogabhāṣya. 2. 12; Nyāyamañjari, p. 472; PPBhā., pp. 637, 643

objectives to be free from both. Therefore, conscientious men have admitted the favourable feeling (*vedanā*) produced from Karma as only pain without having accepted it as pleasure.¹

The two divisions of Karma into puṇya and pāpa have been made from the points of view of feeling. Besides, having kept in view for understanding Karma as good and bad, four divisions of it have been made in the Buddhist and Yoga philosophies, viz. kṛṣṇa (black), śukla (white), śukla-kṛṣṇa (white and black) and aśuklākṛṣṇa (non-white and non-black).² Kṛṣṇa (black) is pāpa, śukla (white) is puṇya, śukla-kṛṣṇa (white and black) is the mixture of puṇya and pāpa and aśuklākṛṣṇa (non-white and non-black) is none of the two, because this Karma is of only dispassionate persons. The fruit is neither pleasure nor pain. The reason is this that there do not take place rāga (attachment) and dveṣa (aversion) in it.³

Besides these, the division of Karma has been made from the points of view of kṛtya (to be performed), pākadāna (ripening oblation) and pākaphala (ripening fruit). In the Buddhist Abhidharma and Visuddhimagga equally⁴ Karma has been divided into four kinds from the point of view of kṛtya, four from that of pākadāna, and four from that of pākaphala, i. e. in all twelve kinds of Karma. But in the Abhidharma four more divisions of Karma have been made from the point of view of pākasthāna (ripening place). On the basis of these views, in the Yogadarśana also⁵ a general discussion is made in regard of Karma but the counting is different from that of the Buddhists.

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1. Paripāmatāpasamīskāraduḥkhaiguṇavṛttivirodhācca
duḥkhameva sarvam vivekiṇah—Yogasūtra, 2. 15.
 2. Dīghanikāya, 3. 1. 2; Buddhacaryā, p. 496;
Yogasūtra, IV. 7
 3. Yogadarśana, 4. 7.
 4. Abhidhammattha Saṃgraha, 5. 19; Visuddhimagga,
19. 14-16.
 5. Yogasūtra, 2. 12-14.

In Jaina philosophy Karma is studied from the four points of view, viz. its nature (prakṛti), duration (sthiti), intensity (anubhāga) and quantity (pradeśa).¹ According to its nature, it is classified into eight fundamental species (mūlaprakṛtis), viz. jñānāvaraṇiyakarma (knowledge-obscuring karma), darśanāvaraṇiyakarma (intuition-obscuring karma), vedanīya-karma (feeling-producing karma), mohanīya-karma (deluding karma which obscures the right attitude of soul to faith and conduct), āyus-karma (longevity—determining karma), nāma-karma (body-making or personality—determining karma with its general and special qualities and faculties), gotra-karma (status-determining karma) e. g. family, clan, caste, nationality, social standing, etc., and antarāyakarma (soul's energy-hindering karma). They are divided and sub-divided further into one hundred and fifty eight kinds of karma (i. e. uttaraprakṛtis of eight basic divisions of karma) with regard to various beings.

STUDY OF KARMA FROM DIFFERENT POINTS OF VIEW

Karmas are produced or manifested by consciousness,² for they are transformed into bad position (sthāna), etc., like matters of beings, accumulated as food and collected as physical structure and there arise in one's mind fear and definite intention for killing a being and putting it to death. This Karma is the cause of bondage of soul.

Karmas produce six kinds of state³ in Soul, viz. (1) audayika (the state of soul caused by the unhindered realization of eight karmaprakṛtis, it consists of all accidental attributes of soul), (2) aupasamika (the state is produced by the suppression of mohanīya-karma, thought it still continues to exists and may

1. BhS., 1. 4, 38; Paññavānā, Ist uddesāka and Karmagrantha, 1-6; Gommaṭasāra, Karmakāṇḍa.
2. Ceyakadā kammā kajjaṁti—BhS., 16. 2. 57.
3. Ibid., 17. 1. 594.

be overcome by proper efforts of self control), (3) parināmika (the essential state comprising the qualities attributed to the soul in itself—the qualities in which nothing is changed through karma), (4) kṣayika (the state produced as a result of annihilation of karma, in this state liberation is attained), (5) kṣayo-paśamika (the mixed state in which some karma is still existing, but some is neutralized and some annihilated. So the existing karma does not realize itself and possesses no intensity), and (6) sannipātikabhāva (the state which consists in the coincidence of several states).

Karmakāraṇa¹ (Process of Karma)

Karmic matter (Karma-pudgala) becomes associated with Soul on account of its passions and activities and at certain states of it the passions are completely destroyed, but mental, vocal and bodily activities still continue in causing consequent influx and bondage of Karma, which require some energy of Soul for their origination. There are stated to be four kinds of kāraṇa (process or organ of energy of soul), viz. mana-vāk-kāya-and karma-karaṇas. The karma-kāraṇa is the process of energy by which the karmic-matter undergoes various processes as a result of different conditions of activities. The process of energy have been divided into eight kinds, viz. bandhana (the condition of energy responsible for bondage of soul), saṃkramāṇa (transformation of one karma into another—the condition of energy responsible for transformation), udvartanā (increased realization of karmas—the condition of energy responsible for increased realization), apavartanā (decreased realization of karma—the condition of energy responsible for decreased realization), udīraṇā (premature realization of karma—the condition of energy responsible for premature realization), upaśamana (subsidence—the condition of energy responsible for subsidence), nidhatti (the condition that is capable of making karmas incapable of all the processes (karaṇas) other than the increased realization and decreased

1. BhS., 6. 1. 230; Jīvaviryam bandhanakrama nādinimittabhūtaṁ karmakāraṇam, Ibid. (Comm.)

realization, and *nikācanā* (the condition that is responsible for making karmas incapable of all the processes).¹

The process of energy (*karaṇa*) of Karma produces a corresponding karmic process and vice versa. Thus *karaṇa* is explained from the aspects of substance, space, time, life, condition, body, sense-organ, speech, mind, passion, expansion of soul (*samudghāṭa*), instinct condition of soul (*leśyā*), attitude of mind, sex-passion, act of killing, matter and its colour, taste, smell, touch and figure (*sāṁsthāna*).² Here *karaṇa* is the means of action "kriyate anena iti *karaṇam*."³

THIRD SECTION

LEŚYĀ (CONDITION OF SOUL)

In Jaina philosophy *Leśyā* is conceived as the condition of Soul-physical as well as psychical. So there are stated to be two kinds of *Leśyā*, viz. *Dravyaleśyā* and *Bhāvaledyā*; the former is physical, while the latter is psychical. In regard to the nature of *Dravyaleśyā*, there are three views, viz. *karmavargaṇā-niṣpanna*, *karmanisyanda* and *yogapariṇāma*. According to the first view, *Leśyādravya* is composed of *karmavargaṇā*; nevertheless, like the karmic body it is different from eight kinds of Karma⁴, such as *Jñānāvaraṇīya* (knowledge-obscuring karma), etc. The contention of the second view is that *Leśyādravya* is the current (or continuity) of binding Karma. Even there being karma in the fourteenth *guṇasthāna* (stage of spiritual development), in the absence of its current (flux) there is the possibility (*upapatti*) of the negation (non-

1. Studies in Jaina Philosophy, p. 254.

2. BhS., 19-9-661.

3. Ibid. (comm.)

4. Utta., ch. 34 (comm.), p. 650.

existence) of *Leśyā*¹ at the stage of spiritual development. Third view² held by Śrī Haribhadrasūri and others says that *Leśyādravya* has been accepted as independent, belonging to *yoga-vargaṇā* (class of activity).

Bhāvaledyā is a particular transformation of Soul which is *anugata* (acquired or brought about) by *sarṅkleṣa* (impurity or affliction) and *yoga* (activity). It is of innumerable kinds, in fact, on account of there being many divisions of *sarṅkleṣa* like intense, more intense and most intense; mild, milder and mildest forms, etc. nevertheless, its nature has been shown in the scriptures by making its division into six kinds in brief, viz. *kṛṣṇa* (black), *nīla* (blue), *kāpota* (grey), *teja* (red), *padma* (lotus) and *śukla* (white).³ The karmic matter communicates colours to the life monad, i. e. the psychological phenomena manifest themselves in six condition of Soul. They are the names to represent the conditions of Soul as if six persons want to enjoy the fruit of a *Jambu* tree. The first person endowed with black *leśyā* wants to cut the *Jambu* tree for its fruits without climbing upon it to get them. The second person having blue *leśyā* says what is the good of cutting the tree and he advises others to cut its branches for the fruits. The third one endowed with grey *leśyā* says that it is not proper to do so in order to serve the purpose by cutting the small branches. The fourth one having red *leśyā* proposes to let off the branches and to break the bunches of fruits for enjoyment. The fifth one possessing lotus *leśyā* says that there is no need of the

1. This view is written by Vādivaitālā Śrī Śāntisūri with the note “*Guravastu vyācakṣate*”, *Uttarā*, p. 650, vide Fourth Karmagrantha, *pariśiṣṭa*, ‘*ka*’ p. 33.

2. *Paññā*, pada 13 (comm.), p. 330;
Dravyānyetāni yogāntargatānīti vicintyatām
Sayogatvena leśyānāmanvayavyatirekataḥ—*Loka.*, *Sarga*, 3, *Sl.* 285.

3. BHS. 1. 7. 22; 12. 5. 450. *Pañña*; 13; *Uttarā*, 34;
Kiñhā nilā kāu, teu pamhā ya sukkā bhavviyarā
Fourth Karmagrantha, *Ga.*, 13, p. 2.

bunches, hence he suggests to take some fruits from them. The sixth person endowed with white leśyā advises that all these thoughts are useless, because the fruits which are needed have fallen on the ground, so their purpose can be served by them.¹

The second example is as follows : Some six persons were going on for plundering wealth. Having reached one village on the way, one of them said, "Let us destroy this village, kill men, animals, birds, whatsoever things are found here and plunder wealth." On hearing this the second person said, "Why should animals, birds, etc., be killed ? Let us kill those men opposing us." The third one said, "Why should the women be killed ? Let us kill the male persons." The fourth one said, "Not all persons, but those who are armed should be killed." The fifth one said, "Why should the armed persons, who are not opposing us, be killed ?" At last the sixth person said, "What is the good by killing somebody ? Take wealth by the means by which it can be stolen, do not kill any body ? It is not justified to plunder wealth on one hand, and to kill its owners on the other hand."²

From these two examples, the nature of Leśyā can clearly be understood. Among the six persons of each example the conditions of souls of the successive persons are found auspicious, more auspicious and most auspicious by order, i. e. the decrease of saṃkleśa and the increase of mildness in pariṇāmas (transformations of soul) are observed here. The division of mankind into six classes on the basis of possession of these six leśyās are as follows. The black are those who are cruel-hearted and kill living beings by violating the vow of non-injury (ahimsā), the first of the five great vows of Nirgrantha religion. The blue are those who are engrossed in their passion or sex instinct or greed and transgress the fourth and fifth vows, i. e. continence and non-possession. The grey are those who are

1. Lokaprakāśa, Sarga 3, 363-66. 71.

2. Ibid, Sarga 3, 363-380;

also Āvaśyaka sūtra, Haribhadriyavṛtti, p. 654.

deceitful and stealing others' things by violating the third vow of non-stealing (adattadāna). The red are those who try to control themselves to observe religion, i. e. the lay worshippers. The lotus ones are firm in controlling them, i. e. the professional mendicants, while the white are those who have attained absolute self-control, Jinakalpa like Lord Mahāvīra.¹

According to the above three views regarding the nature of Leśyādravya, the state of existence or nature (sadbhāva) of Bhāvaleśyā should be understood upto the thirteenth stage of spiritual development (gunasthāna). This postulation is accepted in Gommaṭasāra² because in this work yoga-pravṛtti (activity) has been called Leśyā. In the Sarvārthasiddhi and in another place of Gommaṭasāra yoga-pravṛtti tinged by the rise of passions has been called Leśyā.³ Although the becoming of Leśyā upto the tenth stage of spiritual development is found from this state, but it is not contradictory to the previous statement because of being conditional (apeksa-kṛta). In the previous statement the causative transformations (parināmas) of Karma-prakṛti-pradeśa-bandha are described as Leśyā, while in this account the causative transformations of karmasthitि-anubhāga, etc. four bandhas (bondages) are explained as Leśyā, but not only the causative transformation of prakṛti-pradeśabandha. The study of Dravyaleśyā and Bhāvaleśyā with their respective qualities and transformations, etc., has been made in the Jaina Āgamas and the post-agamic

1. BhS., I. 2. 22; 12. 5. 450.

2. Ayadotti chalessāo, suhatiyalessā du desaviradatiye
Tatto sukkā lessā, ajogitthānam alessam tu—Gommaṭasāra,
Jīva., 531.

3. Bhāvaleśyā kaśayodayarañjitā yoga-pravṛttiriti kṛtvā
audayikītyucyate—Sarvārthasiddhi, ch. II. 6;
Jogapauṭī lessā, kasāya udayāñuramāñjiyā hoi
Tatto doṇṇam kajjam bañdhacaukkam samuddiṭham—
GS., Jivā., 489.

works in details,¹ e. g. kṛṣṇaleśyā is of cloud colour, of bitter taste like that of Nimba,² etc.

As in the Jaina works there is found the discussion on Leśyā indicating the differential states or degrees of the impurity and purity of the internal conditions of souls, something like that there³ is found the division of six classes of mendicants in the view of Gośāla Mañkhasiputra, the Ājivika leader, which has been made on the basis of six colours like black, blue, etc., having taken into account its purity and impurity of karma.

In the Mahābhārata⁴ also there is reference to six colours of Soul, which are similar to some extent with regard to the above consideration. Such conception is found in the Yoga philosophy⁵ of Patañjali because here the division of purity and impurity of conditions of souls has been made by classifying Karma into four divisions, viz. kṛṣṇa (black), śukla-kṛṣṇa (white-black), śukla (white) and aśukla kṛṣṇa (none of them). "The black is found in villains. The white and black is attainable by outer means of attainment. The accumulation of the latest deposit of karma in this (division) is by means of injury or of benefit to others. The white belongs to those who castigate themselves and recite the sacred texts and practise contemplation. Because this kind of karma is confined to the central organ alone. It does not depend upon outer means and it does not grow as a result of injury to others. The neither-

1. BhS., 1. 7. 22; 12. 5. 450; Paññavānā, 13 Leśyāpada, Āvaśyaka Sūtra; Lokaprakāśa, Sarga, 3; Gommaṭasāra, Jīvakāṇḍa, Gāthās 506-507; Leśyāmārganādhikāra, Gāthās, 488-555.

2. BhS., 1. 2. 22; 12. 5. 450.

3. Chālābhijātiye—Dīghanikāya, Sāmaññaphala Sutta, Makkhali Gosālo tenupasam̄kamim.

4. Mbh., 12, 286.

5. Karmaśuklākṛṣṇam Yognastrividhamitareśam—Yogaśūtra, IV; see its Bhāṣya.

white-nor-black is found in the mendicant-saints (*samnyāsin*), whose hindrances have dwindled away, and whose (actual) bodies are their last.”¹

According to Dr. Zimmer, the six types of *Leśyā*, viz. *kṛṣṇaleśyā*, *nīlaleśya*, *kāpotaleśyā*, *tejoleśyā*, *padmaleśyā* and *śuklaleśyā*, each with its colour, smell, taste, and touch, “fall into three groups of two, each pair corresponding precisely to one of the three *Guṇas* or natural qualities of the classic Sāṃkhya and Vedāntic writing”. “The Jaina *Leśyā* 1 and 2 are dark; they correspond to the *Guṇa-tamas*, “darkness”. *Leśyā* 3 is smoky grey, while 4 is of red flame; both pertain to fire, and thus correspond to the *Guṇa-rajas* (fire-rajas, red, colour; of *rañj* “to tinge red”, *rakta* “red”). *Leśyā* 5 and 6, finally are clear and luminous, being states of comparative purity, and thus are the Jaina counterparts of the classic *Guṇa Sattva*; “virtue, goodness, excellence, clarity; ideal being; the supreme state of matter.” “In sum, the six Jaina *leśyās* seem to represent some system of archaic prototypes from which the basic elements of the vastly influential later theory of the *Guṇas* was evolved.”²

1. The Harvard Oriental Series, Vol. XVII, p. 305.
 2. Philosophies of India, pp. 229-230.

FOURTH CHAPTER

ATOMISM

Introduction

The Indian thought on Atomism reflects a stage of the emergence and development of Indian philosophy of a period in the field of metaphysical knowledge, when the daring flight of imagination of the speculative Indian mind with logical nicety went on to search out the basic principle of dissolution and creation of the material universe. In this speculation the Sāṃkhya-Yoga, Vaiśeṣika, Nyāya, Mīmāṃsaka, Baudha, Vedānta and Jaina systems of thought have attacked the problem from their respective angles of vision and made attempts at the explanation and interpretation of the root cause of Atomism. The Cārvākas¹ have admitted four or five elements of Matter as the basis of creation with a support for Atomism.

The Sāṃkhya-yoga² philosophy has conceived an idea of atom as produced from tanmātra (infra-atomic potential) by advocating Prakṛtivāda (doctrine of Primordial Matter) as the fundamental cause of the material universe. The Nyāya-Vaiśeṣika³ has propounded the atomic theory on the basis of avayava (constituent element) and avayavin (composite whole), so its Atomism is based on Sthiratvavāda (doctrine of permanence)

1. Tattvopaplavasimha, p. 1.

2. Sāṃkhyapravacanabhāṣya, Vijñānabhikṣu, ch. I, sūtra 62; Vyāsabhbāṣya on Yogasūtra of Patañjali, pāda IV, sūtra 14, p. 19.

3. Vaiśeṣikadarśana, Kanāda, adhyāya IV, āhnika 1, sūtra 1-2; Nyāyadarśana, Gautama, adhyāya IV, āhnika II, sūtra 15; adhyāya II, āhnika 1, sūtra 35, See Vātsyāyanabhāṣya on them.

and avayavavāda (doctrine of constituent elements), while Atomism of the Buddhist schools¹ of thought like the Vaibhāṣika and the Sautrāntika is supported on Kṣaṇikavāda (doctrine of momentariness), as they are the advocates of this doctrine. The Mīmāṃsakas² like Kumārila and Prabhākara and the Vedantin Madhva³ accepted Atomism on the basis of the atomic theory of the Nyāya-Vaiśeṣika. The Vijñānavādin Buddhists⁴ and the Brahmanavādin Vedantin like Ācārya Śaṅkara⁵, Ācārya Rāmānuja⁶ and others did not admit this Atomism. The Buddhist work 'Vijñaptimātratāsiddhi'⁷ rejected the atomic theory of the Nyāya-Vaiśeṣika system of thought on the ground of constituent parts of atom (avayavas of paramāṇu), while the Vedantin Ācārya Śaṅkara⁸ refuted Atomism of the Vaiśeṣika by following the foot-steps of the Vijñānavādin Buddhist under the influence of the Sāṃkhya doctrine of Prakṛti, buddhi (intellect), tanmātra (infra-atomic potential), etc. Jaina philosophy has conceived the atomic theory on the basis of destruction and origination of the material world from the standpoint of transformation taking place in it due to external and

1. See Śāṅkarabhaṭṭa on Brahmaśūtra (Vedāntadarśana), adhyāya II, pāda II, sūtra 18, pp. 484-87; Abhidharmadīpa, Vimalamitra p. 65; cf. Abhidharmakośa, Vasubandhu, Kośa II, śloka 22, p. 29; Kośa I, śloka 12, p. 6.
2. Ślokavārtika Kumārila, Śūnyavāda, śloka 261, 262, p. 301, Prabhākara Mīmāṃsā, Prabhākara Bhāṭṭa, pp. 64-65, 67-68,
3. Pūrṇaprajñādarśana, Madhva, pp. 67-68.
4. Bodhicaryāvatāra, Śāntideva, Navama pariccheda, pp. 235-236, 28.
5. Śāṅkarabhaṭṭa on Brahmaśūtra, (Vedāntadarśana), adhyāya II, pāda II, Sūtras 11-17, pp. 459-84.
6. Śrībhāṣya., Rāmānuja, adhyāya II, pāda II sūtra 11-17.
7. Vijñaptimātratāsiddhi, Vasubandhu, Kārikā Viṃsatikā, Vide Nyāyadarśana, Phaṇibhūṣaṇa Tarkavegīsha, fifth part, p. 105.
8. Śāṅkarabhaṭṭa on Brahmaśūtra (Vedāntadarśana), adhyāya II, pāda II, sūtras, 11-47, pp. 459-84.

internal causes and made a synthetic approach to the problem of the atomic theory from the aspects substance, locus time and condition¹ by taking into consideration of all the concepts of atom of other Indian systems of thought.

**Denial of Paramāṇuvāda (Atomism) by the
Vijñānavādin Buddhists**

In his *Vijñaptimātratā siddhi*, Vasubandhu made the refutation of the doctrine of *Paramāṇu* (ultimate atom) in the *Viṁśatikā* in the following manner : While rejecting the existence of external object of *Vaibhāṣikas*, he opined by the first *kārikā* that their admitted external object cannot be called one whole nor many and the aggregate of combined atoms, because *paramāṇu* is not proved.² In support of his contention why it is not proved, he said in the second *kārikā* that if having accepted *paramāṇu*, the combination (or conjunction) of other atoms with it is admitted, the existence of atom is not proved. Those which are the objects of *Vijñaptis* (pure sensation or general consciousness) have got no existence. He says that *rūpa* (colour), etc. – the bases of cognition are either one and composite whole (*avayavin-rūpa*), just as found in the conception of the *Vaiśeṣikas*, or atomically many, or the combination (aggregate) of atoms. But one does not become the object of *Vijñapti* (pure sensation or general consciousness), because each and every atom cannot be apprehended from amongst the atoms. Again, the combined

1. Bhagavatī Vyākhyāprajñapti, śataka 25, uddeśaka 4, sūtra 740; śataka 20, uddeśaka 5, sūtra 670; Ācārāṅga Cūrṇi, (Jinadāsaganī) p. 165; Uttarādhyayanasūtra with Tīkā of Kamalasāmyama, p. 99.
2. Na tadekam ca anekam viṣayah paramāṇuśah
Na ca te saṃhatā yasmāt paramāṇurna siddhyati
Saṃkena yugapat paramāṇoh ṣaḍatiśatā
Saṃnām samānadeśatvāt pīṇḍah syādaṇumātrakah.
Vijñaptimātratāsiddhi, Kārikā Viṁśatikā, Vide Nyāyadarśana, Fifth Pt. p. 105.

atoms (*samghātāparamāṇus*) also do not become the object of *Vijñapti*, for it is not proved that atom is one substance. The question is how it is not proved that atom is one substance. On this point Vasubandhu makes an analysis of atom. Why is there the part of atom ? In case it is divisible, then there is no atom. If six atoms, coming from six directions (quarters) — upward and downward and four sides of an intermediate atom, combine with it simultaneously, then *ṣadāṁśatā* (six sidedness or six parts) of an atom is admitted, i. e. an atom has got six parts, for there cannot take place the combination of six atoms in one and the same part of that atom simultaneously. The combination of another atom is not possible then and then in that part in which the combination of one atom takes place. So it is admitted that there takes place the combination of those different six atoms in six different parts of that intermediate atom. Then it cannot be called *paramāṇu* (ultimate atom), because that which has no part and which is the finest of all has been admitted as *paramāṇu*.

And if the simultaneous combination of six atoms in the same part of that intermediate atom is admitted, or the combination of other atoms with the atom having no part is admitted, or if the part which is of one atom is of the six atoms, then there being equal parts of all, all will be a lump-atom only (*pīḍah syādaṇumātrakah*). The lump as a result of combination of seven atoms cannot be gross, so it cannot be visible. This point is untenable. Again, in this condition any kind of lump is not possible, because the combination of other substance with some particular substance in its different parts can only give rise to the grossness of it. But there cannot be any combination of other substance with that which has no different parts. It is admitted for this reason that the grossness of that substance is not possible. Hence an atom is not different from *Vijñāna* (pure sensation); as it is not such, so no external object is proved by any means. Therefore, there is no separate existence of an object of knowledge different from knowledge.

The Kashmitrian Vaibhāsikas say that there does not take

place samyoga (conjunction) of atoms because of their being devoid of parts. But after having been combined, their conjunction takes place. Vasubandhu opines that it should be asked from them whether saṃghātāparamāṇu (combined atom) is rather another entity than these atoms. If there does not take place the conjunction of these atoms, then whose conjunction occurs in combination ? Again, a mutual conjunction of saṃghātāparamāṇus (combined atoms) also does not come about. It should not be said that a conjunction is not proved due to the cause of partlessness of atoms, for there does not take place also a conjunction of Sāvayava saṃghāta (combination with parts). Therefore, atoms are not one single substance whether a conjunction of atoms be iṣṭa (desired) or not. The oneness (ekatva) of that whose digbhāgabheda (division of parts of direction) is admitted is untenable. Atom has got other sides (parts) of eastern direction, of downward direction, etc. In this way, there is digbhāgabheda; then how will the oneness of tadātmakāparamāṇu (identical atom) be reasonable ? And if digbhāgabheda is not admitted, how will there be impenetrability of atom ? How will there be combination ? On the rise of the sun, how do there take place (fall) the shadow somewhere and the sunshine elsewhere ? If other parts are not existing, there is no sunshine. If digbhāgabheda is not desirable, then how does there occur the covering of one atom by another one ? But an atom has no parabhāga (external or outside part) where there takes place the resistance or repulsion (pratighāta) of one atom by another due to the coming into contact and if the resistance or repulsion does not happen, there will be equal spaceness (ākāśatva) of all atoms and all combinations will become only atom, not molecule. If it forms the lump (pīḍa), then the lump is not anything else than the atoms or is other than it (atom). If the lump is not accepted as different from atoms, then it is proved that they are not of the lump. This idea is imaginary. If atom is saṃghāta (combined) or pīḍa (lump), then what is good by holding this view, if there is no denial of the characteristics—rūpa, etc.

Therefore, the characteristics like rūpa, etc., cannot be many. When atom has been disproved, then the multiplicity or manifoldness of substance also has become defective with it (atom). But one cannot ascertain rūpa (matter or visibility) as one substance only, for, if an object of sense of vision (eye) is conceived as one substance, then its undivided apprehension will be direct. But the actual experience in life does not say so. Again, the alternative is meant only for the sake of argument, when discrete atom is disproved, then the combined atom (saṃghāta paramāṇu) also becomes automatically disproved and the objectivity of immediate (direct) matters like eye, etc., also is disproved. Only pure sensation or consciousness (Vijñaptimātra) is proved.¹

1. So'pi parvasamūhatvāt parvāpi svāmśabhedataḥ (86)
 Amśā api tattvato na santityāha—amśā apyaṇubhedenā iti/
 amśāḥ parvabhāgāḥ api aṇubhedenā paramāṇuśo vibhāgena
 bhidyamānatvāt kalpitā eva, aṇavo'pi na pratyekam
 paramārthasantah ityāha—soapyaṇurdigvibhāgataḥ ?
 disāṁ pūrvāparadakṣinottarādharordhvavabhāvānāṁ
 sambandhenā vibhāgato nānātvāt ? tad vibhāgabhedādbhidya
 mānasya paramāṇoh saḍamśatā syāt ? dīksu vā vibhāgāḥ
 nānādigavasthitā nānārūpāmśāḥ paramāṇoh, tato bhedenā
 na tasya svabhāvo ? etc. Vimśatikārikā-14);

Bodhicaryāvatāra, Navama Pariccheda, p. 235.

Ṣaṭkena yugapadyogāt paramāṇoh saḍamśatā
 sannām samānadeśatvāt piṇḍah syādvāṇumātrakah,
 Vimśatikārikā-12.

Te'pi, punaraṇīyāmśo bhāgāḥ tathaiva nirūpyamānāḥ
 nirātmata�ā nabhaḥ-svabhāvatām pratipadyante ityāha
 digvibhāgo'प्त्यादि—digvibhāgo nirāmśatvādākāśam tena
 nāstyāṇuh ?" (87), Ibid., p. 236; pp. 261, 281.

REFUTATION OF PARAMĀNUVĀDA (ATOMISM) BY THE VEDĀNTISTS— ĀCĀRYA ŚAṄKARA AND OTHERS

Having followed the footsteps of the Vijnānavādin Buddhists, Ācārya Śaṅkara, Rāmānuja and other Vedāntists except Madhva have refuted the atomic theory conceived by the Vaiśeṣikas as the ultimate cause of the Universe in connection with the Vaiśeṣika charge against the Vedāntist view of the Brahman as the ultimate cause of the Universe.

According to the Vaiśeṣika system of thought, the qualities inherent in the substance constituting the cause reappear in the substance constituting the effect, e. g. white cloth is produced from white thread. If the intelligent Brahman is the cause of the Universe, then intelligence must reappear in all the effects-objects in the Universe. But it is not the case; intelligence is not perceived in the objects like jar, cloth, etc. For this reason the Brahman is not the cause of the Universe.

In reply to this Vaiśeṣika charge Ācārya Śaṅkara argues that according to the Vaiśeṣikas, the spherical atoms produce the dyads which are minute and short and triads which are great and long, but not any thing spherical. That is to say, the qualities like white colour, etc., which, inhering in the atoms, produce other qualities like white, etc., in the dyads, but the dimension—sphericity (parimāṇḍalya) existing in atom does not produce another sphericity in the dyad. In this way the dyads which are minute and short produce the triads (tryanukas), tetrads (caturanuka), etc., which are big and long and not minute and short, i. e. the dimension of dvyanuka—anyutva (smallness) and hrasvatva (shortness), does not appear in the triad and tetrad. For this reason the Vaiśeṣika principle, “the quality of cause must also be present in the effect” cannot be accepted in all cases. On this ground, Ācārya Śaṅkara opines that just as the dyad having the minute and short dimension is produced from the atoms having the spherical dimension and the triad having great and long dimension is produced

from the minute and short dyads, just so a non-intelligent Universe (*acetana jagat*) may spring forth from the intelligent Brahman.¹

'As to the point of the Vaiśeṣikas that the dyad because of being pervaded by another dimensions, *parimāṇḍalya* (sphericity) of atom cannot produce another *parimāṇḍalya* (sphericity) in it (*dvyāṇuka*), i. e. dyads and triads are endowed with qualities opposed in nature to those of the cause (atom), so that qualities of the cause, being over powered, do not appear in the effect, but non-intelligence is not a quality opposed in nature to intelligence, but its very negation. So there is nothing to prevent the Brahman from reproducing its quality of intelligence in the Universe', Ācārya Śāṅkara replies that it is not proper to say that the cases are parallel, for, according to the Vaiśeṣika view, even the effect being started, an atom remains attributeless for a moment during this period, i. e. before getting affected by other atoms. *Parimāṇḍalya* at this moment can produce itself another *parimāṇḍalya* in the effect. That is to say, if the qualities of sphericity and so on, existing in the cause, do not produce corresponding effects, it is the same with intelligence. Endowment with other qualities does not modify the power of originating effects which belongs to sphericity, for it is admitted that the substance produced remains for a moment devoid of qualities, and only after that moment other qualities begin to come into existence.

If it is argued by the Vaiśeṣikas that *parimāṇḍalya* (sphericity), because of being engaged to produce other dimensions—minute, etc., cannot produce kindred dimension in the dyad, then it is also not justified to say because there are other causes in the origin of other forms (dimensions) like *aṇutva* (minuteness) and *hrasvatva* (shortness) and great and long, not sphericity, according to the Vaiśeṣika sūtra. "The origin of other

1. ŚBhā., on BS., II, 2. 11.

forms is due to other causes.¹" So if sphericity, etc., do not produce like-effects, it is due to their own nature. If it is the nature of sphericity, etc., not to produce like-effects, it may be the nature of Brahman to produce an unlike-effect, the non-intelligent world.

As to the Vaiśeṣika argument that on account of being sāṇidhya (nearness) of the effect to the cause producing above forms – anutva (minuteness), etc. these dimensions can produce that kind of dimension in the dyads, etc., and there being no such nearness to sphericity, it cannot produce such a sphericity in that effect, it is argued by Ācārya Śaṅkara that it is not correct to say so because when a new quality or a substance is produced, then all qualities exist in the cause by equality (samatā) or generality and the relation of inherence (samavāya). That is, "there is also the observed fact that from conjunction there originate substances belonging to a class different from that to which conjunction itself belongs. The doctrine that effects should belong to spring is too wide."² The fallacious reasoning of the rule "just as the cause is, so the effect is produced" is come across in other place, as for example, the conjunction of thread is the cause of cloth, but the conjunction of thread is quality; cloth is not quality. Such is the Brahman; even being cetana (intelligent). there is no difficulty in the origination of the non-intelligent world."³

Bhāskara has adopted this interpretation of the Sūtra "Mahaddīrgħavadvā hrasva-parimandalābhyaṁ". But Rāmānuja and Nimbārka maintain the view that this Sūtra refutes the doctrine of atoms constituting the universal cause. If the atoms are composed of parts, there will arise the fallacy of

1. Kāraṇabhuṭvācca VS., VII. 1. 9; Ato viparītamanu, Ibid., 10; Etena dīrghatvahrasvate vyākhyāte, Ibid., 17.
2. Sarpirjatumadhučhiṣṭānāmagnisaṁyogādadravatvamadbhiḥ sāmānyam—VS., II. 1. 6.
3. Mahaddīrgħavadvā hrasvaparimandalābhyaṁ
ŚBhā. on BS., II. 2. 11.

anavasthā (regress ad infinitum); if they are devoid of parts, they cannot explain the production of other evolutes. Therefore, the atomic view is untenable.

Ācārya Śaṅkara next puts forward the atomic theory of the Vaiśeṣikas and refutes it in the following manner : In the Universe the cloths, etc., are sāvayavadravyas (substances having parts). They, existing in themselves by the relation of inherence (or inhering relation), are produced by the assistance of conjunction (saṃyoga) of threads. By this similarity, whatever things are sāvayava are svānugata (existing in themselves), it is accepted that they are produced by the assistance of conjunction. There where further division of avayava (part=thread), and avayavin (whole=cloth) ceases to be, i. e. come to an end, exists an ultimate atom (paramāṇu). Similarly, this world in which hill, sea, etc., are existing is sāvayava and it is endowed with a beginning and an end because of being sāvayava. And the effect (world) should not be devoid of cause, for this reason atom is the cause of the Universe. Such is the view of Kaṇāda, the author of the Vaiśeṣika Sūtra. Having experienced the four Mahābhūtas (gross elements of Matter) in the Universe four kinds of ultimate atoms have been conceived by the Vaiśeṣikas. Because of there being the division of earth, etc., their division takes place up to an ultimate atom and it is called pralaya (dissolution). After that in the beginning of creation motion is produced by Adṛṣṭa (unseen force) first in air-atoms. This motion (kriyā) unites svāśraya-aṇu (inhering atoms) with other atoms. In this way the great material object called vāyu (air) is produced by the order of dyads, etc. Similarly, fire, water, earth and sensed-body are born. Thus the Universe is constituted by atoms.

Ācārya Śaṅkara refutes this atomic theory of the Vaiśeṣikas in the following manner : The conjunction of atoms existing in the state of division at the time of creation cannot take place without motion, for the conjunction is found in thread, etc., as associated with action (kriyāyuktatantu, etc.), i. e. conjunction

cannot take place without action. There must be some cause (nimitta) of action because of there being kārya (effect). If there were no nimitta (efficient cause) the first action would not have taken place. If nimitta is admitted even, there will come up a defect (dosa), because effort (prayatna), striking and restriking (abhighata), etc., (any such unseen force) are accepted as nimitta of action; there will not be the first action (ādya karma) in the ultimate atoms due to its impossibility (i. e. negation of Adṛṣṭa). The reason is this that the effort—the quality of soul is not possible in that state, for there is the absence of body. When there takes place the conjunction of soul with the reflective mind in the body, then the quality of soul-effort is possible. In this way the solution of dṛṣṭanimitta (perceived cause) like striking (abhighāta), etc., should be made. Thus only after the creation of the mind, etc., effort, striking etc., are possible, but not before that.

If Adṛṣṭa is accepted as nimitta (cause) of the first action, even then one question arises whether that Adṛṣṭa is samavāyin (inhering) in soul (i. e. there is the relation of Adṛṣṭa with soul) or in atom. By both ways Adṛṣṭa can not be nimitta in atoms because Adṛṣṭa itself is non-intelligent (or non-conscious), it cannot perform any action by non-intelligent individuality (svatantratā) till it is not established by or associated with (adhiṣṭhita) intelligent soul (cetana). This is said in the Sāṃkhya Philosophy. For this reason such soul in which intelligence is not born is acetana (non-intelligent) in that state. And if Adṛṣṭa would be samavāyin in soul, it cannot become nimitta (cause) in atoms, because the relation of Adṛṣṭa is with soul, not with atom. If it is argued that there is the relation of atoms with soul which is associated with Adṛṣṭa then there will arise the problem of being constancy in the action on account of the relation being constant, for there is no other determinant in pravṛtti (action). Thus there will be the first action in atoms for there being no definite cause of action in the absence of action; there will not be conjunction and in the absence of it there will not be the effects like dyads, etc.

Next, Ācārya Śaṅkara raises the question whether the conjunction of one atom with another atom is *sarvātmaka* (all-embracing), i. e. one whole atom combines with another whole atom, or *ekadeśin* (partial), i. e. one whole atom combines with the part of another atom. If it is *sarvātmaka* there will arise the problem of *anumātratva* (only one atom) because of there being untenability of increase (*upacaya*). If it is *ekadeśin* (partial or partly), then there will arise the problem of *sāvayavattva* (atom having parts). If it is said that there are imaginary parts of atom, the conjunction will be unreal (non-entity) due to the cause of imaginary objects, because of being *avastu* (non-entity) and the conjunction will not be the cause of object-like effect, and the effect-substances like dyads, etc., will not be produced, if conjunction does not become cause.

Just as in the first stage of creation there does not take place the action in atoms because of there being no production of conjunction due to the absence of *nimitta* (cause), so in the great dissolution also it does not take place in atoms because of there being no production of disjunction, for in that case also no determinant cause is coming forth into perception. *Adṛṣṭa* is also meant for the attainment of enjoyment, pleasure, pain, etc., but not for the attainment of dissolution. Like this the heaven of the Vaiśeṣika will not be there in that state on account of the process of dissolution, and the view that the atom is the ultimate cause will be untenable.¹

Ācārya Śaṅkara says that the Vaiśeṣikas conceive that the dyad produced from two ultimate atoms is very different from these two atoms, and it maintains the relation of inherence with atoms. But they can not support the causation of atom (*anukāraṇatā*) by such conception because the fallacy of infinite regress arises on account of the sameness (identicality) of the mark of causes, e. g. a dyad which inheres in two atoms is different from them and the relation of inherence which is equally different from two atoms must be inherent in them on-

1. ŚBhā. on BS. II, 2.16.

account of a second relation of inherence and so on ad infinitum, for the extreme difference of division is same (equal) in both the cases. Like this the relation of that inherence also with other inhering entities will have to be accepted. In this way there will be a fallacy of infinite regress. In reply to this Vaiśeṣika view, Ācārya Śaṅkara argues that the view of the Vaiśeṣikas is not correct in regard to this point. If it is so, i. e. the inherence is eternally present in the entities seen here and before us, sāmyoga (conjunction) also may be stated to be eternally connected with things which are joined together and need not depend upon a further connection (or relation). It will maintain eternal relation with own things which are joined together. For this reason (i. e. for its own companions) there is no necessity of the second relation of inherence. If it is argued that because of there being a second thing, the conjunction depends upon another relation, then inherence also, because of there being a second object, will depend upon other relation. It is also not correct to say that there is no necessity of other relation (samavāya) for conjunction because of its being quality. Both of them are different from the terms they relate, for both of them depend upon the relation and to call one quality and the other non-quality is only found in the Vaiśeṣika doctrine. For this reason, the dyad will not be produced from the two atoms on account of the fallacy of anavasthā (regress ad infinitum). Therefore, the atomic theory of the Vaiśeṣika is untenable.¹

Ācārya Śaṅkara asks the Vaiśeṣikas what kind of nature of atoms do they admit among the following : active nature (pravṛttisvabhāva) or non-active nature (nirvṛttisvabhāva) or both the natures or neither of them. Among these four alternatives the conception of an ultimate atom (paramāṇu) as cause is untenable by any means. If it is said that there is the active nature of an ultimate atom, there will arise the problem of the

1. ŚBhā. on BS., II. 2. 13

Samavāyābhupagamācca sāmyādanavasthitēḥ.

negation of dissolution (pralaya) because of there being permanent activity in it. If the non-active nature of ultimate atom is accepted, there will come up the question of negation of creation because of there being permanent inactivity in it. If both the active and non-active natures of ultimate atom are accepted, it cannot be possible simultaneously, for both are contradictory to each other. If neither of them (neither active nor non-active nature of ultimate atoms) is accepted, some operative cause must be admitted, i. e. their activity or non-activity would depend upon an operative cause. And if *Adṛṣṭa* is admitted as the operative cause, the activity will be permanent because of *Adṛṣṭa* being in permanent proximity to atoms. If it is said that *Adṛṣṭa* is not the operative cause, there will be permanent non-activity. For this reason paramāṇukāraṇavāda (doctrine of ultimate) as cause is untenable.¹

"The Vaiśeṣika assumes that when substances are broken up into parts, a limit is reached beyond which the process of breaking up cannot be continued. The atoms are the limit. They belong to four classes, and are eternal and possess the qualities like colour, etc. These are the originating principles out of which this material universe of colour, form, etc. is constituted. In reply to this Vaiśeṣika view Ācārya Śaṅkara opines that if atoms have colour, etc., then they are gross and non-permanent. It is found from the daily experience that the things possessing colour, etc., are compared to their causes, gross and non-permanent. A piece of cloth is gross when compared to the threads of which it is made and non-permanent; so the threads are gross compared to the filaments of which they are made. So the atoms possessing colour must be gross and non-external compared to their causes. So the Vaiśeṣika sūtra "That which exists without having a cause is external"² does not apply to atoms. Secondly, the reason, which the Vaiśeṣika gives for the performance of atoms that "if, as

1. ŚBha. on BS., II. 2-14 Nityameva ca bhāvāt.

2. Sadakāraṇavannityam, VS., VI. I.I.

causes, they are not permanent, there is no point in referring to the non-eternality of effects,"¹ is not satisfactory. The eternal cause may be Brahman. Again a word need not always imply the existence of the thing implied by the word. The object must be established as existing by other means of knowledge. If ignorance or non-perception of the cause is too wide, we may believe even binary compounds to be eternal, for they produce perceptible effects and are themselves produced by non-perceived atoms. If it is said that non-perception in avidyā² means that atoms cannot be destroyed either by the destruction of the cause or by disintegration and, therefore, they are to be regarded as eternal, we reply that this reasoning applies only to things that come into being as the result of the combination of several substances. Then the things perish when the substances become separate from each other or are themselves destroyed, but the view of the Vedānta is that the destruction of the effect is possible only by a modification in its condition, as solid ghee is destroyed when it is reduced to a liquid condition. So atoms may not be destroyed or disintegrated but may be transformed into a prior non-atomic condition, which is the condition of the being of Brahman."³ Therefore, the atomic theory is untenable.⁴

According to the Vaiśeṣika view, gross earth possesses the four qualities, viz. colour, taste, smell and touch; fine water possesses the three qualities, viz. colour, taste and touch; still finer fire possesses the two qualities, viz. colour and touch, and air, the finest of all, possesses only the quality of touch. In this way these four gross elements of Matter are found in the world. Ācārya Saṅkara asks the question whether the atoms constituting the four elements possess larger or smaller number

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1. Anitya iti viśeṣataḥ pratīṣedhabhāvah, VS., IV. I. 4.
 2. Paramāṇoranityatvaviṣayā sarvāpyanumitih avidyā bhramarūpā ābhāsāprabhavatvāt, VSU., 4. 1. 5.
 3. BS., pp. 375-376.
 4. ŚBhā on BS., II. 2. 15.

of qualities than their elements in this matter : In both ways the defect will come up, because (1) if it is conceived that atoms are having larger number of qualities, then they will cease to be called paramāṇu because of there being increase in the size of atoms having more qualities. If it is said that there takes place an increase of qualities with an increase of size, then it is not proper to say this, for among the four elements an increase of their size is found with an increase of their qualities. If it is argued that atoms are not endowed with a larger number of qualities, then in order to save the equality of atoms it has to accept that they must have only one quality and in that case the apprehension of touch will not be in fire or that of colour and touch in water, or that of taste, colour and touch in earth will not be found, for the quality of effect is produced from the quality of cause. If all atoms are assumed to be possessed of the four qualities then smell will be found in water, smell and taste in fire, and smell, colour and taste in air. But such is not the case. For this reason the doctrine of ultimate atom (paramāṇu) as cause is unacceptable.¹

Ācārya Śaṅkara says that Pradhānakāraṇavāda (Doctrine of Pradhāna, the Primordial Matter as the ultimate cause of the Universe) has been admitted by Manu and other Vedic scholars on the basis of Satkāryavāda, etc., but no gentleman has accepted Paramāṇu-kāraṇavāda (Doctrine of atom as the ultimate cause) on the basis of division. For this reason it is absolutely disregarded by the advocates of the Vedas.

He opines that there cannot take place the conjunction of the three entities—atoms, soul and mind because of there being no parts of them. That is to say, atoms cannot enter into samyoga (conjunction) with one another and the conjunction of soul with atoms cannot be the cause of the motion of the latter and the conjunction of soul and mind cannot be the cause of cognition because the conjunction of one substance having parts with another having parts is found in experience.

1. ŚBhā on BS., II. 2. 16 (Ubhayathā ca dosāt).

If it is argued that there is the imaginary parts of atom, of soul and mind, then it is not correct to say so, for any entity will be proved by an imagination of non-existing entity in the world. There is no proof in the making of such rules that "this much imagination (kalpanā) only of the existence of non-existing entity, whether illogical or not, should be made, but not an imagination of the existence of an entity more than that. "There is no limit of imagination because of its being independent. As there does not take place a close relationship of the sāvayava dvyaṇuka (dyad having two parts) with niravayava ākāśa (space or ether without parts), so there does not occur a close relationship of sāvayava dvyaṇuka with niravayava paramāṇu (atom without parts) also, for there does not take space a combination of ākāśa (space or ether) and earth, etc., like lac and stick (jatukāṣṭhavat). It is argued that the condition of āśritāśraya (the material relation of dependence and substratum) of the effect-substance (kārya-dravya) and the cause-substance (kāraṇa-dravya) will not be tenable by another method. For this reason inference must be accepted, then it is also not justified to say because there arises the defect of mutual interdependence (itaretarāśraya) in the acceptance of such view of the Vaiśeṣikas. There will be an attainment of itretarāśraya by this way of the pot and plum-tree (kundabadaranyāya)—the providing of āśritāśrayabhāva (relation of dependence and substratum) by kāryakāraṇa (effect-cause) and that of kārya-kāraṇabhāva (effect-cause relation) by āśritāśrayadravyabhāva. The Vedānta does not accept the distinction between effect and cause and admit the relation of dependence and substratum in them, because, according to its view, effect is a kind of condition of cause.

An ultimate atom will be sāvayava (possessed of parts) because of being limited on account of there being that much of its parts as whatever number of sides it may have (i. e. six, or eight, or ten); and thus it will be non-eternal for being sāvayava (possessed of parts). In this way there will arise the contradiction in the Vaiśeṣika doctrine that "there are no parts of atoms.

and they are eternal." If it is argued that the parts which have been conceived in atom by the thought of digbheda (division of direction or relative position) are really atoms, then it is not justified, for atoms also, becoming subtler and subtler up to the cause, can be destroyed, just as earth, because of being very grosser than dvyañuka (dyad), etc., and being really in existence even according to the Vaiśeṣika view, can be destroyed. After this earth there may take place the destruction of other fine things of the category of earth, after that there occurs the destruction of the dyad (dvyañuka), just so atoms also, being of the category of earth should be destroyed.

If it is argued that in case there is the destruction of atom, it happens by the division of parts, then it is not justified to say so, for just as hardness of clarified butter is destroyed, just so atom also is destroyed. That is, just as there takes place the division of clarified butter, gold, etc., but they melt by the conjunction of fire, just so when atom also attains the state of paramakāraṇa (last cause), there will be the destruction of its form, etc. And the origination of an effect does not take place by mere conjunction of parts, for there does not occur the conjunction of parts of milk, water, etc. nevertheless, there is the production of effects like curd, ice, etc., respectively out of milk, water, etc. For this reason, the paramāñukāraṇavāda (Doctrine of atom as ultimate cause) is untenable according to Ācārya Śaṅkara¹. Rāmānuja, Vallabha, Bhāskara, Nimbārka and other Vedāntins also supported the view of Ācārya Śaṅkara by rejecting the atomic theory of the Vaiśeṣikas. But Madhva accepted the conception of atom fully on the basis of the Vaiśeṣika atomic theory.²

ANALYSIS OF ATOMISM

The Indian philosophical schools which have invented, developed and adopted the atomic theory by their speculation

1. ŚBhā. on BS., II. 2. 17.

2. Pūrṇaprajñādarśana, Madhvabhāṣya, pp. 67-8.

may be placed mainly in three groups. The first group is represented by Jaina Metaphysics, the second one by the Vaiśeṣika and Nyāya systems of thought and the Bhāṣya (commentary) on the latter by Vātsyāyana and the Vaibhāṣikas and Sautrāntikas of the Buddhist Philosophy, and the last group of Indian Atomism is represented by Praśastapāda's Bhāṣya which is the oldest systematic exposition of the Vaiśeṣika school of thought and generally adopted by the combined Vaiśeṣika-Nyāya philosophy. As pointed out, the Mīmāṃsakas¹ and the Vedāntin Madhva² accepted the atomic theory on the basis of the Vaiśeṣika conception of it, while the Sāṃkhy-Yoga conceived the idea of atom as generated from tanmāṭra (infra-atomic-potential).

It appears that the speculation about Indian Atomism marks a stage of emergence and development of subtle thought in the field of Indian philosophy in different ages. It has developed from a simpler concept by gradual modifications of scientific thoughts accumulated in successive ages. Thus it has undergone gradual changes with the passage of time.

The seed of Atomism of the Jainas is embodied in the Jaina Āgamas³. Umāsvāti has sown the metaphysical aspect of it in his work Tattvārthādhigama Sūtra⁴ on the basis of the āgamic conception of Atomism Siddhasena Gaṇin,⁵ Ācārya Pūjya-

1. Ślokavārtikā, Kumārila, Śūnyavāda, ślokas, 261, 262, p. 301; Prabhākara Mīmāṃsā, pp. 64-65; 67-68.
2. Pūrṇaprajñādarśana, Madhva, pp. 67-68.
3. Bhagavatī Vyākhyāprajñapti, 14. 1. 513 (see its Tīkā); 20. 6. 670, etc.
4. Tattvārthādhigama Sūtra, Umāsvāti, prathama vibhāga, first edition, 1926, ch. V, sūtras 11. 14, 25, 26, 27, 29, 32, 33, 34, 35, 36.
5. Ibid. (Bhāṣya-Tīkā)

pāda,¹ Ācārya Akalaṅka², Vidyānanda,³ Haribhadra Sūri⁴, Vinayavijayaji⁵ and other later Jainācāryas gradually developed it on a more scientific basis. They organized the entire system of dispute on Ārambhavāda (Doctrine of Intransitive Causation) of the Nyāya Vaiśeṣika and Kṣaṇika-paramāṇuvāda (Doctrine of momentary atom) of the Buddhists and those of other Indian schools of thought in their respective works.

The Jaina thinkers have retained the Buddhist tradition of skandha (molecule), while discarding the Nyāya-Vaiśeṣika view of Avayava-Avayavivāda (Doctrine of constituent part and composite whole) in formulating their concept of paramāṇu (ultimate atom). It appears to have originated from the most primitive ideas about Matter. In Jaina Philosophy Matter (Pudgala) is conceived as an eternal substance undetermined from the point of view of transformation of its quantity and quality. Material particles may combine into one substance and one material substance may disintegrate into many. Every material entity of the cosmic universe is constituted of atoms.

The Nyāya-Vaiśeṣika holds the view that paramāṇu is an ultimate cause of the material world (tadantyam kāraṇam)⁶, but not the effect (kārya), it is the root cause of the elements

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1. Sarvārthasiddhi, Āc. Pūjyapāda, āvṛtti, I, ch. V, sūtras 11, 14, 25, 26, 27, 30, 33, 35, 36, 37.
 2. Tattvārtha Rājavārtika, Akalaṅkadeva, Bhāga II, ch. V, Sūtra II. 14, 25, 26, 27, 30, 33, 36, 37.
 3. Tattvārtha Ślokavārtika, Vidyānanda, ch. V, sūtras-11, 14, 24, 25, 26, 27, 30, 33, 34, 36, 37.
 4. Haribhadriyavṛtti on Tattvārthādhigama Sūtra, ch. V, sūtras, 11, 24, 25, 26, 27, 29, 32, 33, 34, 35, 36.
 5. Lokaprakāśa Vinayavijaya Gaṇin, part-I, sarga 1, śloka 21, p. 5.
 6. Vaiśeṣikadarśana, Kaṇāda, adhyāya, VI, āhnika, I, sūtra 1,2; Nyāyavārtika, Udyotakara, adhyāya IV, āhnika 1, sūtra 21.

of Matter. Jaina Philosophy maintains that paramāṇu is both cause (kāraṇa) and effect (kārya)¹ of the material world from the standpoint of transformation which takes place in the elements of Matter, due to external and internal causes. The Jaina conception of paramāṇu as cause and effect is paralleled to the conception of energy and consequence of energy of the physical sciences.² In the Sāṃkhya-Yoga Philosophy the material existence of paramāṇu is accepted but not as an unit of matter and an ultimate cause of the material universe as it is conceived in the Nyāya-Vaiśeṣika and Jaina systems of thought. It is a produced entity (Janya padārtha) but not an external entity. It is evolved out of the first tanmāṭra (infra-atomic potential).³

A paramāṇu represents a smallest homogeneous part of any substance. As it is not partless, so it is divisible.⁴ This is the radical difference between the atomicity of matter of the Sāṃkhya-Yoga and the atomicity of matter of the Nyāya-Vaiśeṣika and Jaina Philosophies as embodied in their respective works.

According to the Jainas, paramāṇu is ekānta (discrete) and beginningless,⁵ while a skandha (molecule) is not a

1. Tattvārthādhigama Sūtra, Umāsvāti, prathama vibhāga, ch. V, sūtras 26-27; see its Bhāṣya and Tīkā; comm. on the Bhagavatī Vyākhyāprajñapti, 14. 4. 510; Tattvārtha Rājavārtika, Akalāṅka, pp. 491-92.
2. Atomic Physics, Harnwell and Stephens. p. 4.
3. Sāṃkhya-pravacanabhbāṣya, Vijnānabhikṣu, ch. I, sūtra 62; Vyāsabhbāṣya on Yogasūtra of Patañjali, pāda IV, sūtra 14, pp. 191-3.
4. Yogasūtra, Patañjali, pāda III, sūtra 52, see Vyāsabhbāṣya on it, p. 174; Tattvavaiśāradī, Vācaspati Miśra, p. 174.
5. Bhagavatī Vyākhyāprajñapti, 1. 4. 21; 5. 7. 214-15; Anuyogadvārasūtra with Tīkā of Maladhari Hemacandra, sūtra 91. p. 69; Uttarādhyayanasūtra, part, IV, adhyayana, 36, VV. 11, 12, 13, (see Tīkā on them).

single unit and beginningless. A paramāṇu is in samyoga (combination) and it is always undergoing change from the points of view of substance, locus, time and condition.¹ Paramāṇus are infinite in number with regard to substance, a paramāṇu is a finest particle of matter from the point of view of locus, it is momentary from that of time and its capacity of quality is changing from the standpoint of condition.²

The Nyāya-Vaiśeṣika philosophy conceives the indivisibility of paramāṇu³, while the Buddhists⁴—the Vaibhāśikas and the Sautrāntikas maintain the divisibility of paramāṇu (i. e. Samghāta paramāṇu), which consists of, at least, eight parts of elements (aṣṭadravyaka)⁵ of Rūpa (Matter). Jaina philosophy holds the view that sūkṣma paramāṇu (finest ultimate atom) is indivisible, but vyavahāra paramāṇu (usual atom)⁶ and four qualities of paramāṇu, viz. colour, taste, smell and touch, have infinite divisions.⁷ This atomic concept of the Jainas suggests the divisibility of paramāṇu without limit like the divisibility of atom the physical sciences. Really speaking, guṇas (qualities) of the Nyāya-Vaiśeṣika, viz. rūpa (colour), rasa (taste), gandha (smell) and sparśa (touch) are paramāṇus of the Buddhists,⁸

1. Bhagavatī Vyākhāprajñapti, 20. 5. 670; 25. 4. 740; 12. 10. 469.
2. Ibid., 25. 4. 740; 20. 5. 670;
Ācārāṅga Cūrṇi, p. 165; Uttarādhyayana Sūtra with Tīkā of Kamalasāmyama, p. 90.
3. Vaiśeṣikadarśana, Kanāda, adhyāya IV, āhnika I, sūtra 1; adhyāya II, āhnika I, sūtra, 12.
4. Abhidharmakośī, Vasubandhu, Kośa I, V. 12, Tibetan text, p. 83.
5. Abhidharmakośa, II. 22, p. 29.
6. Anuyogadvāra Sūtra, 133, p. 160; Jambudvīpaprajñapti (pūrvabhāga II, sūtra 19, p. 92). Lokaprakāśa, Vinayavijayaji, part I, sarga I, ślokas 21, 28, p. 5.
7. Bhagavatī Vyākhyāprajñapti, 25. 4. 740.
8. Abhidharmakośa, K. I, 10 A, 250 C. D. 65 A. D.

i. e. atoms of quality. Dravyaparamāṇu (material atom) of the Nyāya-Vaiśeṣika corresponds to Saṃghātапaramāṇu (combined atom)¹ of the Buddhists, which is divisible by intellect. It can be compared with pañcikarana of the three gunas (qualities) of prakṛti of the Sāṃkhya philosophy.² Saṃghātапaramāṇu³ of the Buddhists is avinirbhāgī or abhāga (indistinguishable) from the point of view of vyavahāra (modal standpoint), while paramāṇu of the Jainas is anantabhāga (indefinable part) of paramāṇu of the Nyāya-Vaiśeṣika.⁴ The doctrine of permanence had to be refuted by the Buddhists, so their concept of paramāṇu is that it is divisible by intellect.

The Jaina atomic theory comes nearer to the Buddhist concept of atom from the modal point of view, for, according to Jaina Metaphysics, paramāṇu is non-eternal from the modal point of view.⁵ It is of one class⁶ like the energy of matter of the physical sciences. By convention it may be compared with anu (atom) of the Buddhists which is conventionally called atom, as there are stated to be earth-atom, water-atom, air-atom, etc. But they are the forces in the Buddhist convention. Rūpa (colour), rasa (taste), gandha (smell) and sparśa (touch) of Pudgala (Matter) of the Jainas compare well with

1. Abhidharmakośa, K. II. 22, p. 29; K. I. 126; K. I. 10 A;

Paramāṇu(nu)samghāta (7) ityarthā ta evāṣṭau
cakṣurvijñānadhātvādayo (hitvā śesā daśā) saṃcītā—
Abhidharmadīpa, p. 25.

2. Sāṃkhyatattvakaumudi, Kārikā 16, p. 62;
Sāṃkhya Kārikā, Kā. 27, p. 17; Sāṃkhyapravacanabhāṣya,
ch III, sūtras 11,12; ch III, sūtra 19, vide The Positive
Science of the Ancient Hindus, p. 53.

3. Abhidharmakośa, Vasubandhu, Kośa II, śloka 22, p. 29.

4. Nyāyavārtika, Udyotaka, p. 647.

5. Bhagavatī Vyākhyāprajñapti, 14.4. 511.

6. Tattvārthādhigama Sūtra, Umāsvāti, Prathama vibhāga,
p. 324.

the Buddhists' gunas=dharma (qualities=elements) like rūpa (colour), rasa (taste), etc., i. e. atom of colour, atom of taste, etc. Paramānu of the Nyāya-Vaiśeṣika¹ is pūrvaparyāya (previous state or mode) of its own category and also Vijātīyā-sahakārī nimittakāraṇa (assisting instrumental cause of different kind). Paramānu of Jaina Philosophy is beginningless, eternal and non-eternal from the points of view of substance and mode respectively, while paramānu of the Buddhists is non-permanent, as the Buddhists Philosophy holds the view that every entity is evanescent according to its doctrine of momentariness. Paramānu of the Sāṃkhya-yoga also is non-permanent (anitya) as it is a Janyapadārtha (evolved entity), whereas, paramānu of the Nyāya-Vaiśeṣika is beginningless (anādi) and permanent (nitya)² like paramānu of Jaina Metaphysics, but it is to be noted that paramānu of the latter is also non-permanent (anitya) from the modal point of view.

According to Jaina Philosophy, all sūksma paramāṇus are abheda (impassable or impenetrable), acchedya (uncuttable) avibhājya (indivisible), adāhya (incombustible) and agrāhyya (non-receivable)³, while paramānu of the Buddhists appears to be bheda or vibhājya (passable or divisible), for the Buddhist Philosophy advocates the theory of primary and secondary elements of matter.⁴ Paramāṇus of the secondary elements of matter mean varṇa (colour-atom), rasa (taste-atom), gandha (smell-atom) and sparśa (touch-atom), i. e. the Buddhists conceived guṇa (quality) as paramānu and made it distinct from citta (mind), because the entire Buddhist system of thought classifies Rūpa (Matter) into two divisions, viz. primary and secondary elements.

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1. Vaiśeṣikadarśana, Kaṇāda, adhyāya IV, āhnik 1, sūtra 1, 3; Nyāyakandali, Śrīdhara, pp. 78-80.
 2. Vaiśeṣikadarśana, Kaṇāda, adhyāya IV, āhnika, 1, sūtra 1.
 3. Bhagavati Vyākhyāprajñapti, 20. 5. 670.
 4. Abhidharmakośa, Kośa, 1, śloka 10 A.

That is to say, they represent dravya (substance) and guna, (quality) of the Nyāya-Vaiśeṣika. As pointed out, gunas of the Nyāya-Vaiśeṣika are made to be paramāṇu of the Buddhists, while gunas of the Jainas divide paramāṇus. In the Nyāya-Vaiśeṣika Philosophy paramāṇu is accepted as fine and indivisible, but it appears to be gross when compared with paramāṇus of Jaina Metaphysics. This school of thought conceives paramāṇu as finest and indivisible, i. e. sūkṣma paramāṇu is indivisible, but vyavahāra paramāṇu¹ (which can be equated with atom of the physical sciences) is divisible. This is the basic difference between these two atomic theories. The Jaina conception of the nature of paramāṇu is by all means different from that of the nature of paramāṇu of Ārambhavāda (Doctrine of Intransitive causation) of the Vaiśeṣika Philosophy. According to Jaina Metaphysics, there are stated to be infinite paramāṇus, but there does not exist any radical difference among them like pṛthivī paramāṇu (earth-atom), ap-paramāṇu (water-atom), teja-paramāṇu (fire-atom) and vāyu-paramāṇu (air-atom) of the Vaiśeṣika.²

A paramāṇu of Jaina Philosophy can assume any form in accordance with the causal condition. A paramāṇu which has undergone change into the form of earth can undergo transformation, into the forms of water, fire, etc., on the alteration of the material. That is to say, there is no class distinction among paramāṇus as conceived in Jaina metaphysics.³ A paramāṇu is endowed with one colour, one taste, one smell and two touches and it is known by the mark in the form of its effect (Kāryalīṅga).⁴ If a paramāṇu is endowed with one

1. Anuyogadvārasūtra, 133, p. 160; Jambudvīpaprajñapti (pūrvabhāga), sūtra 19, p. 92 (see their tīkās); Lokaprakāśa, Vinayavijayajī, part, 1, sarga 1, śloka 21, 28, p. 5.

2. Vaiśeṣikadarśana, adhyāya IV, āhnika 1, sūtra 3.

3. Tattvārthādhigama sūtra, prathama vibhāga, p. 324.

4. Ibid., ch. V, sūtra 25 (Bhāṣya), p. 365.

colour, it may be black, or blue, or red, or yellow, or white, if it is possessed of one smell, it may have pleasant smell or unpleasant smell, if it is endowed with one taste, it may have bitter taste, or sour taste, or astringent taste, or acideic taste, or sweet taste; if it is possessed of two touches, it may be cold and cohesive, or cold and dry, or warm and cohesive, or warm and dry.¹

The existence of paramāṇu can be inferred on observation of their collective effect. Even its properties are inferred on observation of the basic properties of Pudgala (Matter). Hence it is inferable by its effect for the persons having common knowledge.² In the same line of thought of Jaina Metaphysics the Nyāya-Vaiśeṣika³ and the physical sciences also account for the existence of atoms in this manner. "Individual atomic events are not observed directly, though their consequence may be and hence greater reliance must be placed on logical inference and methodology than in most other branches of sciences."⁴ "Many of the experimental verification of atomic properties depend on observations of the properties of matter on a large scale. Thus the study of the thermodynamics and the statistical behaviour of large number of atoms, which provides a connection between atomic attributes and the gross properties of matter, is very important."⁵

Jaina Philosophy maintains that the capacities— colour, taste, smell and touch, exist as equal in each and every paramāṇu and can change into any form according to cause. Even though they are equal in all paramāṇus, the variousness of their transformation occurs because of the difference of materials. Similarly, according to the Jaina view, skandha (molecule)

1. Bhagavati Vyākhyāprajñapti, 20. 5. 668.

2. Ibid., 18. 8. 640.

3. Nyāyavārtika, p. 233 and its Tātparyatākā, p. 272, Line 1, from the bottom etc.

4. Atomic Physics, Harnwell and Stephens, p. 4.

5. Ibid.

formed by the combination of paramāṇu is not any new material substance, as it is conceived in the Vaiśeṣika Philosophy. It is only one particular form out of the aggregation of paramāṇus.

In the Vaiśeṣika view paramāṇus are Kūṭasthanityā (absolutely permanent)¹ and this Kūṭasthanityatā (absolutely permanence) is proved by all means by maintaining the view that the produced and destroyed substances or quality and action (karma) are different from one another. But Jaina Metaphysics admits pariṇāmanityatā (permanence-in-change) of paramāṇus like the Sāṃkhya by rejecting Kūṭasthanityatā of paramāṇu of the Vaiśeṣika. It conceives all paramāṇus as permanent in their respective individual nature and accounts for their pariṇāmanityatā by accepting skandha (molecule), guṇa (quality) and paryāya (mode), karma (action) as being produced as a result of transformation of paramāṇus.² Thus a skandha is accepted as somehow non-different as well as different from them.

Jaina Philosophy explains all gross and fine material creations (products) on the basis of the capacity of transformation of paramāṇus³ and their combination and dissociation, just as the Sāṃkhya⁴ accounts for the production of the multifroms of the gross and fine material entities of the universe on the ground of differentiated combination of gunas (qualities)—Sattva (essence), Rajas (energy) and Tamas (intertia or mass) from

1. Vaiśeṣikadarśana, adhyāya IV, āhnika, I, sūtra 1; Nyāyakandalī, Śrīdhara, pp. 78-80.
2. Bhagavatī Vyākhyāprajñapti, 5.7.213; 14.4.510-11; Tattvārthādhigamasūtra, prathama vibhāga, ch. V. sūtras 26-27.
3. Ibid., 1.9.73; 8.10.356; 25.4. 730; TS., p. 324.
4. TS., p. 324.
5. Sāṃkhyapravacanabhāṣya, Vijñānabhikṣu, ch. 1, sūtra 62, vide; The Positive Sciences of the Ancient Hindus, p. 29; Vyāsabhbāṣya on Yogasūtra, Patañjali, pāda IV, sutra 14, p. 191.

Prakṛti-one Primordial Matter and its capacity of transformation.

The Nyāya-Vaiśeṣika Philosophy stops by conceiving paramāṇu as the sixth part (or division) of rajakaṇa (mote) perceived in the sunrays,¹ whereas Jaina metaphysics accept an aṇu or a paramāṇu (atom) also as skandha (molecule) of infinite sūkṣmaparamāṇus (finest ultimate atoms).² It explains that infinite paramāṇus and infinite skandhas can exist in a subtle from in one point of space, in which one paramāṇu exists, by virtue of its capacity of samkoca (contraction or capacity of becoming fine)³, e. g. the combinations of the atoms of mercury and gold in a ratio 1:100 Karśas⁴. On this ground paramāṇu is infinite in number also. It should be noted that it is anardha (without half part), amadhyā (without interior part) and apradeśa (without having parts)⁵ i. e. devoid of void from the point of view of kṣetra (locus). It has neither beginning, nor end, nor middle (i. e. nor interior). It is devoid of length, breadth and depth, because of this fineness it is itself beginning; it is itself middle; it is itself end.⁶ Its fineness compares well with the fineness of Prakṛti of the Sāṃkhya. The difference between the two conceptions lies in the fact that even though Prakṛti is fine, it is one and all-pervading, whereas paramāṇus of Jaina Philosophy are infinite in number, but every paramāṇu is finest and smallest, and Lokākāśa or bhautika viśva (cosmic universe) is filled with infinite paramāṇus.

1. Nyāyavārtika, Udyotakara, p. 647.
2. Anuyogadvārasūtra 133, p. 160; Jambudvīpaprajñapti II, sūtra 19, p. 92; Lokaprakāśa, part I, sarga 1, śloka 21, p. 5.
3. Paramāṇukhaṇḍaśaṭṭriṁśikā, Ratnasimḥasūri (vṛtti), p. 2.
4. Bhagavatī Vyākhyāprajñapti, 13.4. (vṛtti), (Sa. 27), mudrita, pa, 608; Lokaprakāśa, Pt. I, 1, vv. 47-48, p. 88.
5. Bhagavatī Vyākhyāprajñapti, 5.7. 215; 20.5. 670.
6. Tattvārtha Rājavārtika, Akalaṅka, Bhāga II, ch. V, sūtra 25; see commentary No. 1, p. 491.

A study of Atomism of all Indian systems of thought reveals that Jaina Philosophy is the advocate of the atomic theory like the Nyāya-Vaiśeṣika. Nevertheless, the nature of paramāṇu conceived in this school of thought is not identical with that of paramāṇu of the Nyāya-Vaiśeṣika. But it compares well with the nature of Prakṛti of the Sāṃkhya, for paramāṇu of this philosophy is transformable like Prakṛti of the Sāṃkhya on this ground paramāṇu of Jainas changes into many forms like earth, water, fire, etc., just as Prakṛti of the Sāṃkhya is the material cause of many effects, such as, earth, water, fire, air, etc. It is not admitted by Jaina Philosophy that the material atoms like earth-atoms, water-atoms, etc., are always basically of different classes. It is to be observed that paramāṇu of the Jainas is finer than paramāṇu of the Nyāya-Vaiśeṣika, but it is unmanifest like Prakṛti of the Sāṃkhya. Anantaparamāṇuvāda (Doctrine of infinite ultimate atoms) of Jaina Philosophy is not far from but nearer to the doctrine of infinite plurality of Prakṛtis of the early Sāṃkhya¹ (with regard to the plurality of puruṣa), i. e. "each being attached to a different puruṣa (self)".²

CONCEPTION OF ATOM IN WESTERN METAPHYSICS AND PHYSICS

The concept of atomicity together with its antithesis continuity was propounded by the Greek philosophers. Atomicity may be roughly described as representing indivisibility, and continuity by divisibility respectively. This early conception of atomicity compares well with the Nyāya-Vaiśeṣika view of

1. Darśana and Cintana, pp. 129-130,
(Jainadharma and Darśana).

2. Yuktidīpikā, p. 169 (Sāṃkhyakārikā Vṛtti). Vide Avidyā, p. 46.

indivisible atom. Leucippus possibly first propounded the atomic theory "as a means out of Zeno's paradox of the hare and tortoise."¹ About one hundred years later Democritus of Abdera advocated the atomicity of matter. These early Greek philosophers had sown the seed of the concept of atom which gradually developed into a full-fledged atomic theory of modern physical sciences. The convincing proof of the atomicity of matter actually came up about 200 years ago when the natural philosophers observed the fact that "the existence of recognizable substance recoverable from homogeneous mixtures was difficult to reconcile with any theory of the continuity of matter."²

In 1738 it was stated by Daniel Bernoulli that "the behaviour of a gas, as the pressure and temperature were changed, could be explained on the hypothesis that the gas consisted of a larger number of infinitesimal particles in rapid motion."³ The most important evidence for the atomic hypothesis probably was found in the two early chemical laws of definite and multiple proportions which are generally associated with the names of J. L. Prout and J. B. Richter in the later part of the eighteenth century. They are as follows :—

(1) "The proportions in which two elements combine cannot vary continuously, (2) If two elements combine together in more than one way, the mass of an element that combines with a given mass of the other are in simple ratios to one another. The laws are summarised succinctly in the present common notation for chemical formula. But it was not until 1808 that John Dalton marshalled and presented the evidence sufficiently convincingly to say scientific opinion to the acceptance of the atomic theory."⁴

Dalton came to the conclusion from the thought of the way in which various elements unite together to form chemical

1. Atomic Physics, ch. II, p. 40.

2. Ibid.

3. Ibid.

4. Ibid., p. 41.

compounds that every element is constituted of atoms. They are "the indestructible and indivisible units of matter. The atoms of each chemical element are identical but different from atoms of other elements."¹ So, according to Dalton's theory, the number of elementary particles is equal to the number of chemical elements including these produced artificially.

Much simpler and more attractive hypothesis was made by W. Prout in 1816 that "the atoms of all elements are built up of one atom, the atom of hydrogen, which would thus correspond to the prime matter, the ylem of the Greeks. Prout based his idea on the assumption that the atomic weights of all elements were whole numbers and, therefore, multiples of the atomic weight of hydrogen, which is given unit value. This assumption proved to be incorrect when stimulated by Prout's hypothesis; more accurate measurements of atomic weights were carried out and found in many cases to have fractional values, as for example 35.457 for chlorine, or 63.54 for copper. Prout's hypothesis was thus abandoned, but only temporarily, for it was revived in a modified form a century later."²

Prout's atomic theory comes nearer to the Jaina conception of atom which is of one class only. "The discovery of radio activity was mainly responsible for the revival of Prout's theory in a modified form and it has brought the evidence that "the atom is destructible."³

ANALYSIS OF CONCEPT OF PARAMĀNU (ULTIMATE ATOM) FROM THE POINT OF VIEW OF THE DEFINITION OF PUDGALA (MATTER)

Paramānupudgala⁴ is called only paramānu⁵ or dravya-

1. Atoms and the Universe, p. 28.

2. Ibid. 3. Ibid., pp. 26-27.

4. Bhagavati Vyākhyāprajñapti, 14.4.513; 20.6.670.

5. Ibid., 20. 6. 670; 18. 6. 631.

paramāṇu¹ (atom of material substance). This conception shows the atomic growth of Matter as found in the physical sciences. Paramāṇu is a substance from the point of view or dravya (substance), for it possesses both guṇa (quality) and paryāya;² it is existent in the universe (loka) and non-existent in the non-universe (aloka) and it cannot go there³ from the stand-point of kṣetra (locus or field). Besides, it exists individually in one space-point as a discrete unit of Matter, it occupies one point of space, but it cannot occupy two or more space-points; it can exist together with other paramāṇus in one space-point⁴ by its capacity of saṁkoca (capacity of becoming fine or of contraction). It is traikālika (existing in three points of time—past, present and future) from the aspect of kāla (time)⁵; it is endowed with the properties—colour, taste, smell and touch from the point of view of bhāva (condition),⁶ as these four qualities are called bhāvas (attributes or capacities) of paramāṇu.⁷

With regard to permanency and constancy the quantity of paramāṇu will remain the same as it is for ever⁸ without loss of destruction, increase or decrease in number. No new paramāṇu will be self-generated nor will be produced by anybody. In the past no new paramāṇu was produced, no new one is produced at present and no new one will be produced in future.⁹ Paramāṇu Pudgala observes the principle of 'utpādayayadhrauvyayuktaṁ sat' (existence is characterized by-

1. Bhagavatī Vyākhyāprajñapti, 20. 6. 670.
2. Ibid., 14. 4. 512; 18. 6. 631.
3. Ibid., 2. 10. 121.
4. Paramāṇukhaṇḍaśaṭṭrimśikā, Ratnasiṁha Śūri, p. 2; Savārthasiddhi, see the Commentary on ch. V., sūtra 14.
5. Bhagavatī Vyākhyāprajñapti, 14. 4. 510.
6. Ibid., 18. 6. 631; 120. 5. 668.
7. Ibid., 20. 5. 670. 8. Ibid., 2. 10. 119; 14. 4. 510.
9. Ibid., 2. 10. 118; Tattvārthādhigama Sūtra, prathama vidhāga, ch. V, sūtra 3; see its auto-auto-commentary, p. 322

origination, destruction and permanence)¹. It is existent from the point of view of asti (existence)².

Paramāṇu is transformable with regard to bhāva-guṇa (quality) colour, taste, smell and touch from the standpoint of pariṇāma (transformation).³ There takes place the transformation of four qualities in all paramāṇus, viz. Varṇapariṇāma (transformation of colour), rasapariṇāma (transformation of taste), gandhapariṇāma (transformation of smell), and sparśapariṇāma (transformation of touch).⁴ The transformation of shape (saṁsthānapariṇāma) does not occur in the individual independent state of paramāṇu, for it is devoid of shape and it does not assume any shape in its discrete condition.⁵ In this state paramāṇu undergoes transformation in the form of increase and decrease of its bhāvas (qualities) by combining with another paramāṇu or paramāṇus. There takes place the transformation in the parts of its bhāva-guṇas, i. e. only the natural transformation occurs in paramāṇu existing in its own state. It is agurulaghu (neither heavy nor light) from the point of view of kāya (mass or body).⁶ It is devoid of lump and part; there is no smaller and lighter form of matter than paramāṇu. It is aguru (not-larger or not-heavier) but laghu (lighter) than any material substance. It is agurulaghu in its own state or individual condition from the point of view of bhāva, i. e. there takes place the process of decrease and increase by six steps (sthānas) in its bhāva-guṇas (qualities). It undergoes transformation by six steps with regard to its own qualities, even when it exists in isolation in its discrete condition. As for example, a paramāṇu is one fold black, it can be infinite-fold back by its capacity of agurulaghu-guṇa and again it can

1. Tattvārthādhigamasūtra, prathama vibhāga, ch. v, sūtra 29, p. 374.

2. Ibid., p. 381.

3. Bhagavatī Vyākhyāprajñapti, 5. 7, 213; TS., p. 437.

4. Ibid., 8. 10. 356; TS., pt. I. p. 324.

5. Ibid., 8. 10. 356, 357.

6. Ibid., I. 9. 73.

became onefold black, having attained a decrease in its guṇas (qualities).¹ The process of decrease and increase takes place at every samaya (moment of instant) by the process of natural transformation.

From the point of view of consciousness it is explained that a paramāṇu-pudgala is not jīva (soul) but ajīva (non-soul). In its own state it is not receivable by Soul. In the classification of paramāṇu the fourth class has been called agrāhya (non-receivable).² That is to say, in its own condition it does not come in the service of soul.³ With regard to sacitta and acittadravyas (living and non-living substances), it is acitta (non-living) in its own individual condition because it is non-receivable by soul, i. e. soul cannot exist in a paramāṇu, therefore, it cannot become living. But soul and paramāṇu can exist together in one space-point.⁴

Paramāṇu has its self-existence or individuality (āyā) from the point of view of individual existence and property of Matter. The meaning of the word 'āyā' is not jīvātmā (soul). A paramāṇu has got its own individuality which has been called here āyā (ātmā). It is manifested in its own bhāvas (states or qualities). It can be said that a paramāṇu possesses its independent nature which is different from another one, i. e. each and every paramāṇu is different from every other paramāṇu or paramāṇus. Therefore, a paramāṇu is endowed with one single individuality or discreteness.⁵ This nature of paramāṇu of the Jainas is similar to that of paramāṇu of the Nyāya-Vaiśeṣika Philosophy, because, according to the latter, each of paramāṇus possesses its own particularity (antya-viśeṣa).⁶

1. Bhagavatī Vyākhyāprajñapti, 25. 3. 730.

2. Ibid., 20. 5. 670.

3. Ibid., 18. 4. 662.

4. Ibid., 13. 4. 484.

5. Ibid., 12. 10. 469.

6. Praśastapādabhāṣya, p. 7.

CONCLUSION WITH A SHORT NOTE ON THE BRĀHMANICAL AND BUDDHIST ATOMIC THEORIES :

The conception of paramāṇu (atom) in the Brāhmaṇical and Buddhist schools has been associated with the theory of the four elements of Matter, viz. earth, water, fire and air. According to this conception, four distinct kinds of atoms correspond to these four elements and their distinctive qualities are inherent in several atoms. This view of the atomic theory has accordingly been accepted by the Brāhmaṇical and Buddhist atomists (i. e. Vaibhāṣikas and Sautrāntikas) on the basis of the atomic growth of elements of Matter, although their opinions differ in details.

The atomic theory is the cardinal tenet of the Vaiśeṣika philosophy.¹ According to its doctrine, "things that exist and are not produced from a cause are eternal; they may be inferred from the fact that all known things are products (effects). Besides, everything perceived is non-eternal, this idea of non-eternity presupposes eternality."² "The uncaused causes

1. Brahmasūtra, II, 2. 11 ff. and Śāṅkarabhāṣya on them.
2. Sadakāraṇavannityam—VS., IV. 1. 1, Pṛthivyādīnāṁ navānāmuddeśāṁ laksāṇapariksāṁ nirvartya prakṛtermūlakāraṇatām Sāṃkhyābhimataṁ niracikṛṣuḥ paramāṇunām mūlakāraṇatvām pṛthivyādyantarbhāvañca sisādhayiṣurnityāsāmānyalakṣaṇām tāvadāha—
Sadakāraṇavannityam, etc. VS. 4. 1. 1;
Tasya kāryam līṅgam, Ibid., IV. 1. 2;
Tasya paramāṇoh kāryam līṅgam, I. 4. 1. 2;
Tathāca Gautamīyaṁ sūtram—Vyaktatā vyaktasya niṣpattiḥ pratyakṣapramāṇyāt—A. 4. 1. ? Avayavāvayaviprasāṅgastāvadanubhūyate sa yadi niravadhiḥ syāt-tadā merusarṣapayoḥ parimāṇa bhedo na syāt,
anantāvayavārabhadhatvāviśeṣat etc, (comm.) 4. 1. 2;
Kāraṇabhbhvāt kāryabhbhvah—Ibid., IV. 1. 3;

of things constitute ignorance (avidyā)¹ on account of which they are not perceived, hence, they are eternal, or as one cannot conceive any other cause of the decay of an object than the disjunction or destruction of its cause, so it is taken for granted that the last causes must be external. Therefore, these eternal things, the causes of the non-eternal ones, are atoms, but they are intangible to the senses, for only the great thing is perceptible in case it possesses many constituent parts and presupposes colour.² Atom is indivisible, as it is not composed of material parts.³

An object is great, if it is constituted of many constituent parts or if the parts themselves are great, or if they are adjusted in a particular way.⁴ The opposite to Mahat (great thing) is aṇu (small thing)⁵ which is not composed of constituent parts, i. e. atom.

The statement "Great, small, long and short", as popularly used are relative terms, for the same object is great with reference to one object and small in relation to another. These points to great objects because they are visible; there they are applied in a secondary sense. But the expressions 'great' and 'small' are not relative terms in the primary sense, but they signify distinct kinds or general of dimension like red and

Rūpādīnām kāraṇe sadbhāvāt kārye sadbhāvah kāraṇa-
guṇapūrvaka hi kāryaguṇa bhavanti ghaṭapaṭādau tathā
darśanādityarthah (comm). 4. 1. 3;

Anitya iti viśeṣataḥ pratīṣedhabhāvah, Ibid., IV. 1. 4.

1. Avidyā—VS., IV. 1. 5;

Paramāṇoranityaviṣayā sarvāpyanunitih avidyā bhrama-
rūpā ābhāsaprabhavatvāt, (comm.) 4. 1. 5.

2. Mahatyanekadrvavyavattāt rūpāccopalabdi ih, VS., IV. 1. 6.

3. Nyāyavārtika, p. 233.

4. Kāraṇabahutvācca, VS. VII. 1. 9;

Mahattvadīrghatva-parimāṇayogābhupagamāt—SBhā on
AS., II. 2. 11.

5. Ato viparītamāṇu, VS., 7. 1. 10;

Etena dīrghattvāhrasvatve vyākhyāte, VS., 7. 1. 17.

blue colours, otherwise one would attribute qualities (great or small) to a quality 'greatness' which goes against the principles that qualities are attributeless". Greatness and smallness are non-eternal in non-eternal entities; they are eternal in eternal ones i. e. absolute or infinite. The absolute small 'āṇu' is spherical in dimension.¹

The qualities like colour, taste, smell and touch in earthen and other material objects disappear on their destruction. But they are eternal in eternal objects like earth-atoms. Similarly, the inherent qualities are eternal in water-atom, fire-atom and air-atom. Some qualities are subject to chemical action (pākaja)² under the influence of heat in earth and earth-atoms. Different atoms come into conjunction.³ In the beginning of creation atoms were set in motion by the unseen force called Adṛṣṭa.⁴ Mind also is atomic⁵ in nature according to the Vaiśeṣika Philosophy. It is to be noted that the word 'Āṇu' denoting atom is used in the Vaiśeṣika and Nyāya Sūtras, while the word 'Paramāṇu' (ultimate atom) is come across in the Nyāyavārtika and later works. Besides, the logic for the existence of āṇu (atom) based on the impossibility of limitless division of an object was not yet applied by Kanāda.

In the Nyāya Sūtra and its Bhāṣya written by Vātsyāyana, some aspects of the atomic theory are dealt with on the one hand, while it is defended against the objections raised by the

1. VS., VII. 1. 10-20.

2. Uktā gunāḥ, VS., VII. 1. 1;

Pṛthivyādirūparasagandhasparśā dravyānityatvādanityāśca
Ibid., VII. 1. 2.,

Etenanityesu nityatvamuktam, Ibid., VII. 1. 3;

Apsu tejasī vāyau ca nityā dravyanityatvāt, Ibid., VII. 1. 4;

Anityeṣvānityā dravyanityatvāt, Ibid., VII. 1. 5;

Kāranaguṇapūrvakāḥ pṛthivyām pākajāḥ, Ibid., VII. 1. 6.

3. Anusamyogastvapratisiddhaḥ, VS., IV. ii. 4.

4. Agnerurddhajvalanām vāyostiryakpavanamaṇūnām
manasaścādyam karmādṛṣṭakārītaṁ, VS., V. ii. 13.

5. Tadabhāvādaṇu manah, VS., VII. 1. 23.

opponents on the other hand. Like the Vaiśeṣikas Gautama accepts the physical properties of the atoms as discussed above, for it is incidentally stated by him that the black colour (of earth atoms) is not eternal¹ in spite of its existence from eternity. Hence it can be presumed that the properties of water, fire, and air are considered non-eternal by him.

The metaphysical aspects relating to atoms are dealt with at the end of the analysis of avayavin (composite whole) and avayava (constituent part). It is maintained by the Naiyāyikas² that the composite whole (avayavin) is something different (arthāntara), not separated from its constituent parts, but rather something in addition to them. "Just as a tree as a whole is perceived, though the atoms—the constituent parts of it are imperceptible." An object composed of parts is called avayavin (composite whole) and so also the parts of a part, and so on ad infinitum. The idea of the composite whole cannot be conceived without reaching the last constituent parts (avayavas), hence the idea of the composite whole would lead to nothing. But the limit of division of a material object ends in the indivisible atom.³ This conception of atom compares well with the early Greek idea of atomicity which means indivisibility. If the division of parts is without limit, the mote would not differ in size from the highest mountain, for

1. *Anuśyāmatāṇītyatvabhaddhā*, NS., IV., 1. 67.
2. *Saviṣayānatikramenendriyasya paṭumadabhbāvadviṣaya-grahanasya tathābhāvo naviṣaye pravṛttih* NS., IV. 11. 14; *Avayavāvayaviprasaṅgaiścaivamāpralayāt*, NS., IV. 11. 15; *Na pralayo anusadbhāvāt*, NS., IT. 11. 16.
Param vā trutēḥ, NS., IV. 11. 17.
3. *Sarvāgrahaṇamavayavyasiddheḥ* NS., II. 1.35;
Paramāṇusamavasthānam tāvad darśanavivayo na bhavatyāt Indriyatvādaṇūnām, Ibid., NBhā; NS., II. 1. 36;
Avayavyarthātarabhūta iti, NBhā., II., 1. 36;
Senāvanavaditi grahanamiti cennātīndriyatvādaṇūnām, NS., II. 2. 37.

both of them would possess the same number of parts¹ in that case.

The further development of the atomic theory of the Naiyāyikas is found in the Nyāyavārtika in this manner that a mote in the ray of the sun entering a window is an atom, while some philosophers maintain that atoms do not exist singly (asamhata), but always in combination.² This view is apparently of the Buddhists—Vaibhāśikas and Sautrāntikas who advocate the idea that atoms are non-eternal, for they are possessed of motion. Like the Vaiśeṣikas the Naiyāyikas also maintain that atoms are set in motion by the unseen force (adṛṣṭa), but they bring God for directing the action of atoms.³

The third stage of the development of the atomic theory is found in the conception of dyad, triad, etc. It was propounded by Udyotakara, subsequently it became the tenet of the Joint Nyāya-Vaiśeṣika works. The union of these two schools of thought began early and became complete at the time of the Nyāyavārtika.

The atomic theory appears to have been embodied into the Buddhist Philosophy by the Sarvāstivādins under the influence of their association with the Vaiśeṣikas. A frequent mention of atoms is made in the Mahāvibhāṣā “in its interpretation of other works and seemingly with no sense of incogruity.”⁴

It seems that the atomic theory was prevalent in the early part of the second century A. D., the probable date of the

1. Kṛtsnajadeśāvṛttitvādavayavānāmavayavyābhāvah, NS., IV. 2. 7; Teṣu cāvṛtterāvayavyabhāvah (8); Pṛthak cāvayavabhyo āvṛtteḥ (9); Na cāvayavyavayavāḥ (10); Ekaśmin bhedābhāvādbhedaśabdaprayogānupatterapraśnah (11); Avayavāntarābhāve'pyavṛtterahetuh (12); Keśasamūhe taimirikopalabdhivattadupalabdhih (13) NS., iv. 2.

2. Nyāyavārtika, p. 234. 3. PPBhā., p. 21.

4. A Manual of Buddhist Philosophy, p. 126.

Mahāvibhāṣā, as evidenced by the fact that the whole theory in its developed form is contained in the Abhidharma Hṛdaya.¹ It had an important place in the metaphysics of Vasubandhu and Saṃghabhadra. It was admitted provisionally by the early Yogācārins in spite of their idealism, but it was refuted by the later Yogācārins, beginning with Diśnāga² on the ground that it stood on the path of the doctrine of store-house of consciousness (ālayavijñāna), i. e. all phenomena emerge from mind.

A detailed study of the atomic theory as conceived in the North does not seem to have been made by the Neo-Sthaviravādin school established by Buddhaghoṣa, but the use of the Kalāpa theory (doctrine corresponding to the concept of Saṃghātāparamāṇu of the Sarvāstivādins) was made by Buddhaghoṣa in the Atṭhasalini and was admitted as an integral part of the Sarvāstivādin Philosophy, the idea being mentioned and considerably developed in the Abhidhammattha Saṃgaha. The name 'Paramāṇu' was attributed to the ultimate of molecule; thus the atomic theory is considered to be an integral part of the Sarvāstivādins.³

According to this school, there are stated to be fourteen kinds of atom—five atoms of the five sense-organs, five atoms of the five sense-objects and four atoms of four Mahābhūtas. In the Śāṅkarabhāṣya⁴ also the atomic theory of the Sarvāstivādins is described in this way : ‘These Buddhists acknowledge the four elements—earth, water, fire, and wind with their properties and products, including the organs of sense; the four elements are atomic, the earth-atoms have the quality of hardness, the water-atoms that of viscosity, the fire-atoms that

1. It was translated into Chinese in the third Century A.D., Vide A Manual of Buddhist Philosophy, p. 126.

2. Ibid., see Ālambana pratyaya.

3. Ibid.

4. ŚBhā. on BS., II. 2. 18.

of heat and the air-atoms that of motion, in combination of these atoms form earthly things, etc."¹

It is admitted by the Vaibhāśikas that an atom had six sides, but it is maintained by them that "they made but one or what comes to the same that the space within an atom cannot be divided." Their view is refuted by the Naiyāyikas in an old verse quoted in the Nyāyavārtika.² Their view that "atoms are ammenable to sense-knowledge, though were not visible apart, just as a dim sighted man sees a mass of hair, though he cannot see a single hair",³ is also disputed by the Naiyāyikas, according to whom, atom is transcendental and intangible to the sense.

According to the Sautrāntikas, the aggregate of seven atoms is the smallest compound (*anu*)⁴ and the spherical atom did not touch one another completely, but there was an intervening space between them. One thing emerges out of this discussion on the conception of atom that it is indivisible according to all Indian systems of thought, though it is admitted by some that it might be regarded as possessing parts, viz. eight sides. It is maintained by both the Vaibhāśikas and the Sautrāntikas that atoms are impenetrable.

The atoms of the Buddhist Philosophy are non-eternal; they emerge into being from time to time and then they are destroyed (cf A. K. 12, later half). The ten kinds of atom, i. e. five atoms of the five sense-organs and five atoms of the five sense-objects, are produced due to the four atoms of the four fundamental elements (*Mahābhūtas*) and they would instantly be destroyed, if there were not the sustaining power of the four elemental atoms.⁵ Therefore, every derivative atom has an

1. Sarvadarśanasamgraha, p. 24, p. 14;

SBhā. II, 2. 18 (BS); see E. R. E., Vol. II, pp. 199-200.

2. Nyāyavārtika, pp. 521-22.

3. E. R. E., Vol. II. p. 201.

4. Abh., D., p. 65, cf. Abh. K., II. 22.

5. Dhṛtyādikarmasamsiddhaḥ kharasnehoṣṇateranāḥ,
Abh., K. I. 12.

atom of each of the fundamental elements with it for its substance.¹ The atoms of the four fundamental elements of Matter are non-permanent, constantly undergoing change by the process of origination, continuance, decay and destruction followed by a new process of origination, etc. The phenomenalist atomic conception of the Buddhists is in contrary to the substantive theory of atom of the Jaina, Nyāya-Vaiśeṣika and other Indian systems of thought. As regards the antiquity of Atomic theory Jaina Atomism is earlier than Greek Atomism.

1. Abh. K. 4. 29.

FIFTH CHAPTER PROPERTIES OF MATTER

FIRST SECTION GENERAL PROPERTIES OF MATTER

Properties of Matter are the characteristic qualities. According to Jaina Philosophy, Matter is endowed with specific characters of two kinds : those which are inherent in ultimate atoms as well as in aggregates (molecules) and those which are found only in aggregates. It is stated in the Jaina Āgama that Matter is characterized by colour, taste, odour and touch from the points of view of condition (*bhāva*)¹. They are inherent in ultimate atoms as well as in aggregates of ultimate atoms as the specific properties. In addition to them, an aggregate of two units, or three units, up to that of infinite units of matter is possessed of the physical characters—mutual attraction and repulsion, fineness and grossness, shape and figure, divisibility, opacity and casting of shadows and heat and light energy.² They appear as the manifestations of Matter. On the basis of the āgamic account of them the Post-āgamic works³ explain them in details.

1. Bhāvao vāṇīmāmte rasamāmte gamdhāmāmte phāsamāmte, Bhs., 2. 10. 118;
Sparśarasagandhavarṇavantah pudgalāḥ, TS., V. 23, p. 355.
2. Saukṣmya-sthulya-saṁsthāna-bheda-tamaśchāyā-tapodyatavantaśca, TS., V. 24, p. 356.
3. Sparśarasagandhavarṇavantah pudgalāḥ, TS., V. 23, p. 355;
Sparśāḥ rasāḥ gandhāḥ varṇā ityevaṁ lakṣaṇāḥ pudgalā bhavanti, TS., Bhā., V. 23, p. 355;
Vāṇīrasagamdhaphāsā paramāṇuparuvidā visesā hi Davvādo ya anaṇṇā anpattapagāsagā hoṁti, PS., 57;
Varnagandharasparśamayāścānāntā pudgalāḥ,
Vardhamānapurāṇa of Ācārya Sakalakīrti.

In the philosophies like the Vaiśeṣika, etc., the corporeal substances, viz. earth, water, fire and air, have not been accepted as equally endowed with these four specific characters, viz. colour, taste, smell and touch, but it has been admitted that earth is possessed of these four qualities, water is possessed of three qualities without smell, fire is possessed of two qualities—colour and touch without smell and taste, and air is possessed of touch only.¹ Like this they have not accepted four qualities—colour, taste, smell and touch as inherent in mind² according to Jaina philosophy.

For this reason the purport of the sūtra “Spaṛgasagandhavarnāvantaḥ pudgalāḥ” is to show the difference of its view from those of the Nyāya-Vaiśeṣika system of thought and others.³ It is indicated by this aphorism that in Jaina philosophy Matter and Soul are different. Therefore, the application of the word “Pudgala” is not meant for Soul.⁴ In this way, earth, water, fire and air are equal as Matters⁵ i. e. all of them are endowed with four qualities. And in Jaina Metaphysics mind also is possessed of these qualities, because of its being material.⁶ It is to be noted that in the physical science also colour, taste, odour and touch have been accepted as the properties of

1. Rūparasagandhasparśavatī pṛthivī, VS., II. 1. 1;
Rūparasasparśavatyāpo dravāḥ snigdhāḥ, Ibid., 2;
Tejo rūpasparśavat, Ibid., 3;
Spaṛśavān vāyuh, Ibid., 4.
2. Sarvārthaśiddhi (comm.), v. 3.
3. Atha sparśādimantaḥ syuḥ pudgalāḥ iti sūcanāt
Kṣityādijātibhedānām prakalpananirākṛtiḥ,
Tattvārtha Ślo., p. 419.
4. Yasmāditthaṁ lakṣaṇāḥ pudgalā bhavanti tasmānna jīvāḥ
pudgalāśabdavācyā iti / yathā caite paramāṇvādigataḥ
jīvāḥ sparśādayaḥ guṇāḥ paramāṇvādibhyo bhindāścā-
bhinnāśca tathā'guṇaparyāyavaddravyam,
TS. Bhā., II, p. 355.
5. TS., p. 415.
6. TS., p. 355.

Matter, just as they are found in Jaina Philosophy. "The colour of a material substance is an important physical property and the apparent colour of a substance depends upon its state of subdivision. The colour becomes lighter as large particles are ground up into smaller ones."¹ "The properties of taste and odour are closely correlated with the chemical nature of substances, and are to be considered as chemical properties."² In regard to touch³ the properties of the material substances like malleability, ductility, hardness, etc., are dealt with in details in the physical science.

Akalaṅka, Vidyānanda and Siddhasena Gaṇin give the reasons why have these four basic properties of Matter been placed in the order of touch, taste, smell and colour respectively in the Tattvārthādhigama Sūtra. Touch is prominent (strong) among all the properties of Matter, because the manifestation of touch in the spr̥ṣṭa-grāhī-indriyas (tactile sense-organs) takes place first and it becomes apprehensible to the worldly beings. For this reason touch has been first accepted among the properties of Matter. According to Jaina Metaphysics, eye is aprāpyakārī, i. e. it does not go up to the object; it apprehends its own object from a distance, while the Nyāya Philosophy maintains that eye is prāpyakārī i. e. it reaches the object to apprehend it; the Sāṃkhya says that every sense-organ and mind also go up to the object and then apprehend it.

Although among the worldly beings, indifferent to touch, the manifestation of taste (rasavyāpāra) is sometimes found prominent in the object; nevertheless, on the touch of it, the manifestation of taste takes place. For this reason taste has been placed after touch because the apprehension of taste occurs after that of touch. In air also taste, colour, etc., are accepted to be inherent, hence there is no fallacy. The properties like colour, etc., are inherent in it. Just as the qualities

1. General Chemistry, Pauling, p. 12

2. Ibid., p. 13.

3. Ibid., p. 12.

like colour etc., even being inherent in the non-apprehended fragrant substance, are intangible because of being unproduced or fine and they are not experienced as becoming a gross object of the sense-organs like eye, etc., so colour, etc., of air also are apprehended by the sense-organs. Smell has been posited before colour because it is imperceptible. Last of all colour has been accepted on the ground that it is experienced as inhering in the gross material substance only.¹

It is further stated in the Āgamas and the post-Āgamic works that Matter possesses five colours, five tastes, two smells and eight touches. The numbers of colour, of taste, of smell, and of touch are specifically mentioned in them in the following manner: colour is of five kinds, viz. black, blue, red, yellow and white; taste is of five kinds, viz. bitter, sour, acidic, sweet and astringent; smell is of two kinds, viz. pleasant and unpleasant; and touch is of eight kinds, viz. soft, hard, heavy, light, cold, hot, smooth and rough.² The sub-division of modes of each of these twenty kinds of property of Matter may be one to countable, countless and infinite³ from the standpoint of the relation (state) of degrees. At every samaya (instant) the possible divisions of four qualities among them are found in each and every matter. In other words, every one of them has got one

1. *Viśayabalattvāt sparśagrahaṇamādau*, TS., p. 355;
Sparśagrahaṇamādau viśayabaladarśanāt (1);
Rasaprasaṅga iti cet; na; *sparśe sati tadbhāvāt* (2);
Vāyau tadabhāvāt vyabhicāra iti cet; na *tatrāpyabhyupagamāt*, (3); RV., p. 484;
2. *Rūpāt prāggardhavacanām acākṣuṣatvāt...ante varṇagrahaṇām sthauļye sati tadupalabdheḥ* (5); RV., p. 484;
TS. Śl., p. 419; TS., p. 355.
3. *Poggale pañcavāṇe pañcarase dugañdhe aṭṭhaphāse pañnatte*, Bhs., 12. 5. 450; *TS. Bhā.*, p. 356; SS., p. 356; RV., pp. 484-5.
4. *Bhs.*, 25.4, 739; *Anuyogadvāra*, p. 110;
Ta ete mūlabhedāḥ pratyekām sañkhyeyāsañkheyānañtābhedaśca bhavanti, SS., 5. 23 (Comm.).

to infinitefold transformations or modifications (states) of degrees. At every samaya (instant) the possible divisions of four qualities among them are found in each and every form of matter. In other words, every one of them has got one to infinitefold transformations or modifications. As for instance, there are stated to be onefold black, twofold, black, threefold black up to tenfold black, numerablefold black, innumerable-fold black and infinitefold black colour; the accounts of blue, red, yellow and white also should thus be understood. Similarly, those of pleasant and unpleasant smells, of five tastes and of eight touches should be known.

The Jaina conception of five colours of Matter appears to be scientific. Black, blue, red, yellow and white are inherent colours in Matter; they are the basic colours and more scientific and up-to-date, as it is demonstrated by the following statements. "As the temperature of a body is raised, it emits first of all infra-red radiation, then red light, then yellow light, and finally white light. If we could obtain even higher temperatures in the laboratory, we could make bodies 'blue hot', as is actually observed with some of the stars."¹

"As the temperature of a body is raised, the colour emitted by it becomes more and more rich in waves of shorter-wavelength. Some of the stars shine with a bluish white light which indicates that their temperature must be very high."² "The infra-red rays are the dark heat rays which do not generate the sensation of vision. These rays are present in what appears to be perfect darkness to us. The eyes of a cat or of an owl are provided with the infra-red rays, so that these animals can perceive in the dark."³ Now-a-days photographs can be taken in utter darkness with the help of infra-red-rays. "So long as the temperature is below the draper point, 525°C, a body

1. A Text Book of Heat by A. W. Barton, p. 361.

2. Dr. M. N. Saha, F.R.S. and B. N. Srivastava, p. 341,

Vide Cosmology Old and New, p. 166.

3. Cosmology, Old and New, p. 166.

emits only infra-red rays; in other words, it appears dark or black, then the colour changes to red, then white and finally blue.”¹

It is to be noted here that these colours are not pigmentary, but natural colours which are assumed by a piece of matter at a different conditions of temperature. Their number is only five, viz. black, red, yellow, white and blue. Hence they are identical with the five kinds of inherent colour of Pudgala (Matter) as conceived in Jaina Philosophy.²

According to some, green should be included in the list of natural colours and black and white are unnecessary, for white is a mixture of green and red pigments and black is the absence of colours. It should be observed here that the above mentioned five colours are not pigmentary. The fundamental colours—red, green, and bluish-violet are needed by a canvas painter to produce a desired colour from them by mixing three powders in different portion, while the three colours—red, yellow and blue are required in tri-colour printing on paper.³

Even it is demonstrated in the case of the colours of solar spectrum that in case “the red light is cut off from the spectrum by an opaque screen and the remaining six colours then recombined by a prism, the resulting light would be green.”⁴ That means “what appears to be green is only white light minus red.”⁵ Besides, there lies a distinction between a mixture of special colours and that of pigment colours. The mixture of blue and yellow light produces white light, whereas, the mixture of blue and yellow pigments generate a green paint. This demonstrates clearly that the five basic colours of Matter are not special nor pigmentary. The modern definition of

1. Cosmology Old and New, p. 166.

2. Varna sa pameavidhah kṛṣṇa-nīla-pīta-śukla-lohita bhedāt, SS., V. 23.

3. Cosmology Old and New, p. 164.

4. Ibid.

5. Ibid.

colour says, "colour is the general term for all sensations arising from the activity of the retina and its attached nervous mechanism. It may be exemplified by the enumeration of the characteristic instances, such as, red, yellow, blue, black and white."¹

So the five inherent colours of Pudgala (Matter) as conceived in Jaina Metaphysics agree well with the five natural colours of matter of the physical sciences. In regard to the infinite modes of these five colours, they can be compared with the difference of wave lengths, as "the apparent colour of a material substance depends upon its state of sub-divisions, it becomes lighter as large particles are ground up into smaller ones."²

As to the five kinds of taste, viz. bitter, sour, acidic, sweet, and astringent, it can be said that the modern scientific research has demonstrated that there are in the taste only five general classes, viz. sweet, bitter, saltish, sour, and insipid.³ In regard to the division of smell into two kinds, viz. pleasant and unpleasant, there is no controversy in any Metaphysics and Physics. The four parts of the quality of touch (*sparsa*) or eight divisions of touch (*sparsa*) of Jaina Philosophy correspond to the following four physical properties of Matter according to the physical sciences—Scale of hardness (*mṛdu-kathina*=soft and hard), density (*guru-laghu*=heavy and light) temperature (*śīta* and *usṇa*=cold and warm) and crystalline structure (*snigdha-rūkṣa*=smooth and rough or cohesive and dry).

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1. Report of the Colorimetry Committee, 1922, Optical Society of America, vide Cosmology, Old and New p. 168.
 2. Ibid.
 3. See the article "Taste and Chemical Constitution" by A. J. Mee, M. A., in the Science Progress, October, 1934, vide Cosmology Old and New, p. 164.

THE SĀMKHYA VIEW OF THE PROPERTIES OF MATTER

Dr. B. N. Seal explains that “the properties of a thing are only the energies that are manifested in the particular collocations of the three Guṇas—Mass, Energy and Essence; and a tri-Tanmātric or a penta-Tanmātric atom, i. e. an atom composed of three or five kinds of Tanmātras may differ from another of the same class in respect of the number of constituent Tanmātras of a particular kind, as also of their collocation or grouping, and therefore, in mass as well as in generic and specific characters.”¹

According to the Sāṃkhya-Pātañjala—the properties (energies) of the substances originate from the grouping or the quanta of the Tanmātras, or the guṇas themselves, e. g. “various kinds of fruit acids and juices, all originating from one and the same Bhūta (water) with different accretions of earthy matters (bhūvikāraḥ)”.²

So it is maintained that the four Bhūtas or Mahābhūtas

1. Yogyatāvacchinna dharmīṇah śaktireva dharmaṇi, Yoga-sūtra, Vyāsabhāṣya 3, vide The Positive Sciences of the Ancient Hindus, p. 44.
2. The Positive Sciences of the Ancient Hindus, p. 45; Yo...dharmeṣu anupāti sāmānyaviśeṣātmā so anvayī dharmin, Yogabhāṣya, III. 14;

Syādetat—kathaṁ ekarūpāṇāṁ guṇānāṁ anekarūpā pravṛttiḥ ityata āha pariṇāmataḥ salilavat / yathā hi Vāri-davimutajñ udakam ekarasam̄ api tattadbhūvikārān āśadya nārikela-tāla tati-vilva-ciravilva-tindukāmalaka-kapittha-phalarasatayāpariṇāmāt madhurāmlalavaṇatiktakaśāya-kaṭutayā vikalpate, evamekaikaguṇasamudbhavāt pradhānānāṁ guṇānāṁ āśritya apradhānaguṇāḥ pariṇāma-bhedān pravarttayanti / tadidamuktān pratipratiguṇāśraya-viśeṣāt ekaikaguṇāśrayena yo viśegastasmāt ityarthah, Tattvakaumudi, Vācaspati on Kārikā, 16. See : P. S. A. H., pp. 45-6.

(fundamental elements of Matter), viz. air, fire, water and earth, possess the four specific qualities, viz. touch, colour, taste and smell respectively as conceived in the Nyāya-Vaiśeṣika system of thought. The difference between the Sāṃkhya-Yoga and Jaina views regarding these properties is this that they are the specific qualities in the four Bhūtas (fundamental elements) respectively, according to the former, while in the latter's view all of them are inherent in every kind of matter whether it is earth or water or fire or air.

THE NYĀYA-VAIŚEŠIKA VIEW OF THE PROPERTIES OF MATTER

The four general properties of Matter (Pudgala) of Jaina Philosophy, viz. colour, taste, smell and touch, are stated to be the four specific qualities of Matter¹ of the Nyāya-Vaiśeṣika Metaphysics. According to its view, earth possesses colour, taste, smell and touch,² besides number, dimension, conjunction, disjunction, priority, posteriority, weight, fluidity, velocity and elasticity. Smell is the specific quality of earth which differentiates it from other substances. In addition to them, it possesses motion (kriyā)³ which generates velocity (vega),⁴ weight (gurutva)⁵ and fall (patana),⁶ liquidity

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1. Rūparasagandhasparśāḥ, VS., I. 1.6;
Rūparasagandhasparśā..., PPBhā., p. 38.
 2. Rūparasagandhasparśavatī pr̥thivi, VS., II. 1. 1.
 3. Nodanābhīhātāt saṃyuktasaṃyogācca pr̥thivyām karma, VS., V. 2. 1.
 4. Yattu Yugapat prakṣiptaśarayorekasya tīvra vego aparasya tu mandaḥ tatra, nodanatīvatvamandatve nimittam, VSU., 5. 1. 17.
 5. Saṃskārābhāve gurutvāt patanam, VS., 5. 1. 18.
 6. Ibid.

¹ (dravatva) and law of affinity.²

Water is possessed of all the qualities of earth-substance except smell with this distinction that its characteristic of natural.³ Of these colour, taste, touch, natural fluidity and viscosity are the specific qualities of water by which it is differentiated from all other elements of Matter.⁴

Fire is possessed of all the qualities in common with earth and water except taste, smell and weight due to the negation of which it moves upwards, viz. colour, touch, number, dimension, separateness, conjunction, disjunction, priority, posteriority, fluidity and velocity.⁵ Colour and touch are only its distinctive characteristics. Its colour is white and illuminating (*bhāsvara*) and its touch is hot.⁶ The liquidity in it is not intrinsic, but it is perceived when a strong heat is generated as in the case of all the metals.⁷

1. Sarpirjatumadhūcchiṣṭānāmagnisamyoगाद-dravatvamadbhiḥ sāmānyaṁ, VS., II. 1. 6;
Trapusīsaloharajatasuvarṇānāmagnisamyogād-dravatvamadbhiḥ sāmānyaṁ, Ibid., II. 1. 7.
 2. Bhūyastvād-gandhavattvācca pṛthivī gandhajñāne prakṛtiḥ, VS., VIII., 2. 5.
 3. Rūparasasparśadravatvasnehasāmīkhyāparimāṇapṛthaktvāsamyogavibhāgāparatvāparatvadrvatvasāmīskāravatyah pūrvavaddeśām siddhiḥ, PPBhā., p. 91; Āptvābhisaṁbandhādāpaḥ, PPBhā., p. 14.
 4. Rūparasasparśavatya'po dravāḥ snigdhāḥ, VS., II. 1. 2.
 5. Tejastvābhisaṁbandhat-tejaḥ, PPBhā., p. 15;
Rūpasparśasāmīkhyāparimāṇapṛthaktvāsamyogavibhāgāparatvāparatvadrvatvasāmīskāravat pūrvavadeśām siddhiḥ tatra śuklam bhāsvarañca rūpam uṣṇa eva sparśāḥ, PPBhā., p. 15.
 6. Tejo rūpasparśavat, VS., II. 1. 3 ;
Tatra śuklam bhāsvarañca rūpam uṣṇa eva sparśāḥ, PPBhā., p. 15.
 7. Vyoma, (PPBhā.), pp. 255-60 ; See PPBhā., 25.

Air possesses the characteristics of touch, number, dimension, separateness, conjunction, disjunction, priority, posteriority and velocity¹ in common with earth, water and fire of these touch is the distinctive characteristic of it, which is non-chemical and neither hot nor cold.² This quality differentiates it from earth, water and fire. Air is possessed of oblique or transversal motion (tiryag-gati),³ but no weight⁴ in the absence of which it does not come down. Its motion is unimpeded as it receives the impetus from the velocity of air.⁵ The Nyāya-Vaiśeṣika view on the properties of Matter suffers from some defects, when they are analysed in the light of the physical sciences. As for instance, it maintains that air does not possess any weight, but modern physics demonstrates that air also is possessed of weight. In agreement with the physical sciences Jaina Metaphysics holds the view- that air also possesses the quality of weight because of being a form of Matter.

KINDS OF FOUR SPECIFIC QUALITIES OF MATTER IN THE NYĀYA-VAIŚEŠIKA METAPHYSICS

Colour : According to the Nyāya-Vaiśeṣika Philosophy, there are stated to be seven kinds of colour, viz. white, blue or black, yellow, green, grey, red and citra (variegated colour)

1. Sparśavān vāyuḥ, VS. 11.1.4. Vāyutvābhisambandhādvāyuh
sparśasāmkyaparimāṇapṛthaktvasarīyogavibhāgaparatvā-
paratvasamskāravān, PPBha., Vāyunirupaṇaprakaraṇam.
2. Sparśaśca vāyoḥ, VS., 11.1.9; Sparśo'syānuṣṭāśitatve
satyapākajah, guṇa/iniveśātsiddhaḥ, PPBhā., p. 17.
3. Agnerurddhvajvalanam vāyostiryakpavanamaṇūnām mana-
saścādyam karmādṛṣṭakāritam, VS., V. 2. 13.
4. PPBhā., Vāyunirupaṇaprakaraṇam.
5. Preraṇādiheturekah san kriyābhedādapānādisamjñām
labhate, Ibid.

belonging naturally to earth.¹ When compared with the five basic colours of Jaina Metaphysics, these seven colours of the former can be reduced to the five colours of the latter, for green, grey and variegated colours are not the original colours of Matter as demonstrated by the physical sciences.

Taste : Taste is of six kinds, viz. sweet, acidic, saltish, bitter, sour and pungent (or astringent) belonging to earth². Here the saltish taste is not the basic taste of Matter according to Jaina Metaphysics. But it is accepted by the science as one of the basic tastes. So there is a difference between the two systems in regard to the basic tastes, but the Jaina view is nearer to that of the physical sciences.

Smell : Like Jaina Philosophy the Nyāya-Vaiśeṣika mentions two kinds of smell, viz. good and bad (i. e. pleasant and unpleasant)³. But according to this philosophy, they belong to earth only, while the Jaina system of thought maintains that they belong to all forms of Matter.

Touch : The Nyāya-Vaiśeṣika maintains that touch⁴

1. Śuklādiyanekaprakāraṁ salilādiparamāṇuṣu nityam pārthivaparamāṇuṣvagni—śamyogavirodhī sarvakāryadravyeṣu kāraṇaṇguṇapūrvakamāśrayavināśadeva vinaśyati, PPBhā., p. 44 ; see NK., p. 30.

The word 'citra' is used for an independent colour (Kiraṇāval of Udayana, p. 205).

2. Raso rasanāgrāhyah pṛthivyudakavṛttih jīvanapuṣṭibalārogyanimittam rasanasahakārī madhurāmlalavaṇatikatakuṭaṣāyabhedabhinnah asyāpi nityānityatvaniṣpattayo rūpavat, PPBhā., Rasaprakaraṇam, p. 45.
3. Gandho ghrāṇagṛāhyah pṛthivīvṛttih ghrāṇasahakārī surabhirasuraviśca asyāpi pūrvavadutpattyādayo vyākhyātah, PPBhā., Gandhaprakaraṇam, p. 45.
4. Sparśastvagindriyagrāhyah kṣitiyudakajvalanapavanavṛttih, Tvakṣahakārī rūpānuvidhāyī śītoṣṇānusnaśītabhedāt trividhah asyāpi nityānityatvaniṣpattayah pūrvavat, PPBhā., Sparśaprakaraṇam, p. 45.

belonging to earth is of three kinds, viz. hot, cold and neither hot nor cold, which are generated from chemical action. But the Jaina view is that there are eight kinds of touch which can be grouped into four divisions, as already pointed out, on the basis of their conception in the physical sciences.

These four specific qualities—colour, taste, smell and touch are possessed by both the earthly form of matter—eternal and non-eternal. But they are non-eternal in both the cases because of chemical action, unlike the qualities, belonging to the ultimate atoms of water, fire, and air. The Mīmāṃsaka view on the properties of Matter is the same as they are found in the Nyāya-Vaiśeṣika Philosophy, for its very conception of Matter is based on the Nyāya-Vaiśeṣika doctrine of Matter.

PROPERTIES OF MATTER IN THE BUDDHIST PHILOSOPHY

As previously touched upon, the general property of Matter (Rūpa) conceived in the Buddhist Philosophy is impenetrability (sapratigha), i. e. space occupied by one of the elements of Matter cannot be occupied by another at one and the same time.¹ In Jaina metaphysics paramāṇu (ultimate atom) has been characterized by the property of impenetrability, besides the effects of Matter have been described as ghāṭaśarīra and aghāṭaśarīra (obstructive and unobstructive bodies). The ghāṭaśarīra (obstructive body) offers resistance to causes which tend to produce a change in its position, configuration or

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1. Yaṁ taṁ rūpaṁ ajjhaththikam taṁ sappatigham. yaṁ taṁ rūpaṁ bahiram, taṁ atthi sappatigham, atthi appatigham, Dhamma Saṅgani, 3, Tikamātikā, pp. 151, 152, 156, 157; Yaṁ taṁ rūpaṁ saṁdassanam taṁ atthi sappatigham, atthi appatigham, Aṭṭhasālini, 4, 16, p. 244 - 245; Yaṁ rūpaṁ sappatigham taṁ atthi indriyam—Aṭṭhasālini 4.17, pp. 244-45.

motion, while *aghātaśarīra* allows the passage of another form of Matter through it. Even infinite atoms can exist in one space-point. Each ultimate atom or aggregate is individually impenetrable, but all ultimate atoms and aggregates (*skandhas*) are not impenetrable, for they can exist in one space-point. At one stage of it an ultimate atom is impenetrable. This is the basic difference between the impenetrability of the Buddhist elements (*dharma*s) of Matter and that of the Jaina ultimate atoms or the effects of Matter.

Though the Buddhist Philosophy denies the existence of any permanent substance possessing inherent qualities, it can be said in a nutshell that hardness (or repulsion), cohesion (or attraction), heat and motion¹ are respectively the four essentials or specific properties of the four fundamental elements of Matter, viz. earth, water, fire and air, which are manifested by them. Besides, the four sensibles, viz. colour, taste, smell and touch², can also be counted as the properties of Matter (*Rūpa*) according to the Buddhist Metaphysics, for it recognizes only *guṇas* (qualities) as elements of Matter by denying the substances.

The four essentials—hardness, cohensiveness, heat and motion, predominate in earth, water, fire and air respectively. For this reason they are termed as *pṛthivī* (earth), *apo* (water), *tejo* (fire) and *vāyu* (air) technically, but *pāṭhavī-adhika*,³ *apo-adhika* substances and the like are not themselves *pāṭhavī* (earth), *apo* (water), etc. It is explained by the commentators that "apo is that which diffuses itself throughout its coexistent

1. See *Dhammasaṅgani* and *Aṭṭhasālinī*, (*Rūpaskandha*);

Bhūtānī pṛthivīdhāturaptejovāyudhātavāḥ

Dhṛtyādikarmasaṁsiddhāḥ kharasnehoṣṇateranāḥ,
Abh. K., 1.12.

2. *Kāme aṣṭadravyako aṇuḥ rūparasagandhasparśā iti catvāri dravyāṇi pṛthivyaptejo vāyuḥ iti catvāri*, Abh. K., 1.22, *Sphuṭārthā*.

3. i. e. preponderating in *pāṭhavī*.

qualities or that which increases the bulk of them.¹" "It is that which heaps them well together, without allowing them to be scattered about or that which imbibes (absorbs) them or that which holds or collects them together as it were by imbibition."²

Leaving aside the etymological derivation of apo from āpeti, appāyati, pāti or pivati, it is to be observed that both the Ceylonese and Burmese traditions suggest that apo is 'cohesion' (bandhanattanarūpassa).³

The mass is held together by the force of cohesion; on its removal by splitting the mass, only cohesion—the force of attraction is left in them. In the case of the reduction of the fragments to smaller particles, it exists inhering in upto the ultimate individual atoms. This fact shows the correctness of the phrase "diffuses or locates itself by pervading its co-existent qualities." The phrase "increase the bulk of them" is justified by the thing that a great body is constituted of smaller bodies by this force of attraction (cohesion). The remaining phrases are justified by the fact that cohesion holds together a mass of matter.⁴

"Poggharaṇa-svabhāva" or fluidity is accepted as the characteristic mark (lakkhana) of water, while regarding cohe-

1. Āpeti sahajātarūpāni pattharati, appāyati vā rūheti vadḍheti tīti āpo (Ceylon, Cyclopaedia, p. 167 on Abhidhammattha-Saṅgaha), vide Compendium of Philosophy, p. 268. No mention is made of watery element (āpo).
2. Āpeti sahajātarūpāni vyāpetvā tiṭṭhati;...avippakiññāni katvā bhuso Pāti rakkhati pivati vā pivanto viya tāni saṅgañhāti sañcipindetiti āpo, Ledi, Sadaw, p. 246. It is to be noted that water is not that which imbibes, but that which is imbibed Cph. pp. 267-9.
3. Dhammasaṅgani 8, 652; So Buddhaghosa comments on this passage, A. Sl. p. 355, vide Compendium of Philosophy, pp. 268 ff.
4. Compendium of Philosophy, pp. 268 ff.

sion as its functions (*kicca*).¹ But it should be noted that still more fluidity is possessed by air than water, hence 'poggharaṇa' does not clearly suggest water any more than it implies air. According to the Buddhists, fluidity is associated with apo (water), just as it is found in the Nyāya-Vaiśeṣika Philosophy; water is mentioned as an apo-adhika substance (i. e. preponderantly cohesive). The physical sciences maintain that there is more cohesion in solids than in liquids and gas ; whereas the Buddhist system of thought regards hardness or firmness (*kak-khalatta*) as the characteristic mark of solids (*pāṭhavī*), because, however, a solid may be apparently cohesive, once it is broken up, its original cohesiveness goes away, but there does not take place re-cohesion. But a liquid cannot be divided because it tends to re-coalesce immediately. Similarly, air behaves in the same manner to some extent, but its capacity of expansion without limit tends to counteract the force of cohesion holding the particles of air or gas together.² Therefore, air is conceived in the Buddhist Philosophy as the type of mobility (*vāyu-Iraṇa*=motion). Tejo (fire) is heat; cold or relative absence of heat is not mentioned in the Buddhist Metaphysics as a force distinct from heat. 'Lambent' and 'fiery' may only fit occasionally in popular phraseology. Fire matures; sharpens, intensifies or imports heat to the other three essentials. *Vāyu* (air) is that which as the condition of motion to another place brings about the impact of one essential with another.³

In the words of Ledi again "that which vibrates or oscillates; that which, as a condition of motion in space, moves the series of elements to a different place, or carries its co-existent qualities from place to place", (p. 240), i. e. motion (*Iraṇa*) is the essential of *vāyu*.

According to the later Vaibhāṣikas, the air-atoms are

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1. Compendium of Philosophy, pp. 268 ff.
 2. Ibid.
 3. Vāyati deśantaruppattihetubhāvena bhuṭasamghātaḥ
pāpetīti vayo, C. Ph., p. 270. (Ceylon, cy., p. 167).

touch-sensibles possessing impact or pressure (*traṇa*) as their characteristic property; they constitute air-element by aggregation; the fire-atoms are colour and touch-sensibles with heat as their characteristic property, and constitute fire-element by aggregation; the water-atoms are taste, colour, and touch-sensibles having a characteristic viscosity and they constitute water element by combination, and the earth-atoms are smell, taste, colour, and touch-sensibles possessing a characteristic property of dryness or roughness of hardness (*kharatva*) and constitutes earth-element.¹ Here the *Vaiśeṣika* influence is evidently felt on the later *Vaibhāṣika* conception of properties of Matter.

KINDS OF PROPERTIES OF RŪPA (MATTER)

Colour : According to the *Vaibhāṣikas*, there are stated to be four kinds of primary colour, namely, blue, red, yellow and white and there are eight kinds of secondary colours of cloud, vapour, dust, dew (*mihika*), shadow, heat, light and darkness respectively. Black colour does not find mention in the list of primary colours as it is found in Jaina Philosophy. And shape is of eight kinds, viz. long, short, round, spherical, high and low, even and uneven. Thus there are twenty kinds of Rūpa (colour and shape).² Spherical and round shapes are common to both Jaina and Buddhist Metaphysics, the former

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1. Kāme aṣṭadravyakośabdaḥ paramāṇurāṇindriyaḥ, ABh. K., II. 22;

rūpa-rasa-gandha-sparśa iti cattvāri dravyāṇi-pṛthiviyaptejo vāyu, iti catvāri, also kharasnehoṣṇeraṇā svabhāvāni bhūtāni, Abh., K. Spht.:

Bhūtāni pṛthividhātūraptejovāyudhātvaḥ dhṛtyādikarma-saṃsiddhāḥ, kharasnehoṣṇeraṇāḥ, Abh. K., I. 12.

Vide the Positive Sciences of the Ancient Hindus, pp. 92-93.

2. Rūpāṇ dvidhā viśiṣṭatidhā, Abh., K., I. 10.

mentions triangular, square and rectangular shapes in addition to them and another which is none of them.

Taste : The Vaibhāṣikas maintain that taste is the aggregate of a class of atoms. So, according to them, it is a substantial entity. Those atoms called taste are endowed with the nature distinct from colour, shape, and sound-atoms. Like other atoms, i. e. colour-atoms, etc., taste-atom also is modifiable (*savikāra*) and impenetrable (*sapratiṣṭha*). Thus, because of being modifiable and impenetrable, taste-atom also will be included in Rūpa (Matter). For this reason they have been included in rūpaprasāda. Like the Vaiśeṣika the Vaibhāṣika school divides taste into six kinds, viz. madhura (sweet), amla (acidic), lavaṇa (saltish), kaṭu (sour), kaṣāya (astringent) and tikta (bitter), though it is mainly divided into infinite kinds from the secondary points of view. Various kinds of tastes are produced by different kinds of mixtures of taste-atoms. It is to be noted that here six kinds of taste are mentioned, whereas in Jaina Metaphysics only five kinds of taste are enumerated. The basic difference between the two views in regard to the number of tastes is this that the Buddhist Philosophy has accepted the saltish taste as an additional one on the basis of the Vaiśeṣika doctrine of Matter.

Smell : In the Vaibhāṣika view smell is the aggregate of a class of atoms. These atoms also are distinct from other atoms. According to this concept, bhautikatva (materiality) is the general characteristic of smell. In the smell-entity which has not been the object of smelling perception (or sensation) of any being, the objectivity of perception produced by the sense of smell cannot be called the general characteristic of smell, because it will be avyāpta (non-related or non-pervasive). Smell is mainly divided into two kinds, viz. pleasant and unpleasant as they are found in the Jaina and Nyāya-Vaiśeṣika systems of thought. On the basis of intensity and non-intensity in each of them they are sub-divided into four kinds—two kinds of pleasant smell and two kinds of unpleasant smell.

TANGIBLE OR TACTILE ELEMENT (SPRASHTAVYA)

The aggregate of a class of combined atoms has been called sprashtavya (tactile or tangible); it is a substantial entity; it is not qualitative entity like that of the Vaiśeṣikas. The objectivity of perception produced by the tactile sense-organ (skin) cannot be called the general characteristic of it, for, really speaking, that characteristic will become avyāptā (non-related or non-pervasive) in the tactile element which did not come into perception of any being. According to the previous procedure, all these—rūpa (colour and shape), rasa (taste) and gandha (smell) being different, materiality (bhautikatva) also cannot be accepted as the general characteristic of sprashtavya (tangible), for it will be avyāptā in the tangibility like roughness or hardness, etc.

This sprashtavya is divided into eleven kinds, viz. pārthiviasparśa (earthy touch), jalīya-sparśa (aquatic touch), taijasasparśa (fiery touch), vāyavīya-sparśa (airy touch), mṛduṭā (softness), karkasṭā (hardness or roughness), gurutva (heaviness), and laghutva (lightness), śitatva (coldness), vubhukṣā (hungriness or appetite) and pipāsā (thirst). Soft, hard, heavy and light and cold touches are common to both the Jaina and Buddhist traditions. As a result of particular closeness (sanniveśa) of the elements like earth, etc., there takes place the contact of the physical senses with particular condition, so one thinks of the necessity of heat; that of particular condition is śitatva (coldness). Vubhukṣā means the desire to eat, this is a kind of mental element. It can never be included in the sprashtavya dharma (tangibility), belonging to Rūpaskandha (material aggregate). Hence, in this case of vubhukṣā it will be understood that there takes place in the animal body a kind of temporary transformation of earth-element in the inner part of the stomach. If there is the contact of the physical sense with that, there arises the desire of beings for eating. As that material transformation

inside the stomach is the cause of vubhukṣā, it has been called vubhukṣā. In the cause there is the analogical application of the effect-indicating word. In the scripture the birth of Lord Buddha has been called happiness. It is the mental element and birth is the physical element, so birth and happiness cannot be one and the same. In spite of such division the birth of Lord Buddha has been called happiness. He is born for various kinds of emergence and attainment of liberation. So his birth, because of being helpful to happiness like abhyudaya (emergence) and niḥśreyasa (liberation) has been called happiness analogically. This is the analogical application of the effect-indicating word in the cause. Similarly, pipāsā also, belonging to the sprāṣṭavyadharma should be understood as a kind of transformation, not as the desire for drinking. Such kind of mental element cannot be included in sprāṣṭavyadharma (tangible-element). The internal physical transformation with which the contact of the physical sense leads the beings to desire for drinking has been called pipāsā in this case.¹

In regard to the general properties of Matter, viz. colour, taste, smell and touch the basic difference between the Jaina view and those of other Indian systems of thought is this that according to the former, they are inherent in all forms of Matter whether molecules or ultimate atoms, whereas they are regarded as the specific qualities of the four elements of Matter in the latter. According to their views, only earth possesses four characteristics, viz. colour, taste, smell and touch. In the physical sciences the Jaina view regarding the four general characteristics of Matter, viz. colour, taste, smell and touch, is well supported to a considerable extent. Besides, their respective divisions also compare well with those of the same four kinds of property of Matter as demonstrated in the physical sciences.

1. Vaibhāṣikadharśana of Anantakumāra Bhāttācārya, (Bengali) Rūpaskandha, p. 88.

In addition to the four general characteristics of Matter (Pudgala) certain common properties are associated with all the three states of it, viz. solid, liquid and gasesous. Matter possesses the property of cohesion and adhesion (snehakāyatva or saṃghātaguṇa),¹ impenetrability,² extension,³ divisibility (bhedatva or pradeśatva),⁴ porosity and compressibility⁵ (or condensation and taking up subtle form) and density⁶ and elasticity, etc.⁷

Cohesion is the force of attraction between molecules (or aggregates) of the same type and adhesion is the force of attraction that exists between molecules of different nature. Cohesive force holds molecules together in a material substance and adhesion is the cause of sticking together of the two material substances (pudgaladravyas), e. g. gluing of wood to wood. The combination of ultimate atoms takes place owing to the presence of the property of oily body or sticky substance (sinehakāe), i. e. cohesiveness and adhesiveness inherent in them. Thus two ultimate atoms may combine together into a skandha (molecule) because of their property of cohesiveness and adhesiveness.

1. Sinehakāe poggale, BhS., 1. 10. 80; Gahaṇaguṇalakhaṇe, Ibid., 2. 10. 118.
2. Abhejja, Ibid., 20. 5. 670.
3. Poggalatthikāe, Ibid., 2. 10. 118; Ajīvakāyā dharmādharmākāśapudgalāḥ, TS., ch. V. 1.
4. BhS., 16. 6. 582; Ekapradeśādiṣu bhājyah pudgalānām, TS., V. 14; Bhedāt, TS., V. 27.
5. BhS., 6. 7. 247; 1. 6. 54.
6. Pañṇavaṇā, Alpatvabahutva.
7. Doṇham paramāṇupoggala egayo sahanām̄ti doṇham paramāṇu poggalānām atihi sinehakāe, BhS., 1. 10. 80.

IMPERMEABILITY¹

It is a property of Matter by virtue of which two bodies cannot occupy the same space at the same time. In regard to this property there arises the contradiction in the Jaina conception of impassability or impenetrability of ultimate atom (*paramāṇu*), for there can exist one to infinite ultimate atoms or molecules in one space-point in a subtle form.

Extension : It is the property of Matter by virtue of which every body occupies some definite space. As an *astikāyadravya* (extensive substance) Matter has existence as well as extensive magnitude; even an ultimate atom has the property of extension of one space-point.²

Divisibility (Bhedatva) : It is the property of Matter by virtue of which a material substance can be sub-divided into extreme minute parts. Even greater sub-division of the particles of Matter takes place when a scent or perfume spreads out in air. A ketaki flower smells out for hours without any visible changes in mass. Its smell spreads through the air. Neither the ketaki flower nor the core of it blows with the air, but the finest division (atom of smell) of matter blows with the air.³ That is why there is found the smell pervading the atmosphere and the air surcharged with it.

Porosity⁴ : It is the property of Matter by virtue of which one material substance enters or diffuses into another easily and rapidly; all bodies contain pores more or less; these pores point to spaces intervened between one cluster of molecules and another, e. g. solid, ash or sand, liquid water, gas etc.

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1. *Paramāṇupoggale nām Bhānte asidhāram vā khuradhāram vā ogāhejjā...no tinaṭṭhe samattṭhe, no khalu tattha sattham kamai,* BhS., 5. 7. 213; 20.5. 670.
 2. Bhs., 1.3.4.481 ; TS., ch. V.I.
 3. *No koṭṭhae vāti javāu. no keyai vāti ghāṇasahagatā poggalā vāti,* Bhs., 16.6.59.
 4. BhS., 1.6.55 ; RV., p. 465.

Compressibility¹ : It is the property of Matter by virtue of which it can be compressed so as to occupy a smaller volume by the application of external pressure because of there being pores contained by all bodies, e. g. cotton, hair and air.

Density² and Elasticity : Density is the mass per unit volume of body, so it is a universal property of all forms of Matter—molecules or ultimate atoms, for all material bodies must have some mass. Elasticity which is possessed by all matters more or less in all the three states of them--solid, liquid and gas is the property of offering resistances³ to change in size or shape.

SECOND SECTION

MOTION (GATI) OF MATTER (PUDGALA) OSCILLATION OR VIBRATION

According to Jaina Philosophy, there are stated to be two kinds of bhāva (state) of substance, viz. parispondātmaka and aparispandātmaka (vibrating and non-vibrating or mobile and immobile).⁴ Dharma (Principle of Motion), Adharma (Principle of Rest) and Ākāśa (Space) is immobile. There is no capacity in them for making movement at all.⁵ Soul (Jīva) is immobile by nature but the capacity for movement is intrinsic in it and an element (pradeśa) of Soul moves by the contact of karmic matter due to the activities of the material mind, speech and body.⁶ Matter (Pudgala) possesses the nature of both

1. BhS., 6. 7. 247 (hair) ; 1.6.54 (air).
2. BhS., 1. 6. 53 (alpabahutva); see Pañṇavānā (alpatvabahutva).
3. BhS., 1. 6. 54 ; Sthā., 211. 6.
4. Dravyasya hi bhāvo dvividhaḥ-parispandātmakah aparispandātmakaśca, TRV., V. 22.21.
5. Niṣkriyāṇi ca tāṇīti parispanḍa-vimuktitāḥ, T Śl. V. 7. 2.
6. Yogātmapradeśaparispanḍaḥ, TRV., II. 25. 4.

mobility and immobility or vibration and non-vibration. In the *Tattvārtha Rājavārtika* parispandana (vibratory motion) and aparispandana (non-vibratory motion) have been called *kriyā* (activity) and *parināma* (change or transformation)¹ respectively, while in the *Pradīpikāvṛtti* of *Pravacanasāra* parispandana has been called *kriyā* (activity of action) and each *parināma* (change=arthaparyāya-parināma) has been stated to be *bhāva* (state or condition).² Siddhasena Gaṇin has called 'parispandetara' prayogajaparyāya-svabhāva-parināma³ ('non-moving' voluntary modal nature as change).

PARISPANDANA (RESOLUTION OF ALL PHYSICAL ACTION INTO MOTION)

Dr. B. N. Seal explains that "Parispandana sometimes stands for motion-molar as well as molecular, but more often for the subtle motion of atoms or molecules."⁴ The term 'parispandana' signifies "whirling or rotatory motion, a circling motion," but also simple harmonic motion, e. g. vibration. "All action, operation, work (*kriyā*, *vyāpāra*) is ultimately traced to this form of subtle motion lodged in the atoms or in the matter-stuff."⁵ As for example, a cosmic vibratory motion is stated by the *Vedānta*.⁶ Ākāśa is "the first stadium in the evolution of Matter, which gives off Vāyu, which gives of tejas

1. *Parispandātmakah kriyātyākhyāyate itarah parināmāḥ*, TRV., V. 22.21.
2. *Parināmamātralakṣaṇo bhāvah*, *parispandanalakṣaṇa kriyā*, *Pravacanasāra*, *Pradīpikāvṛtti*, II. 37, p. 182.
3. *Dravyasya svajātīyaparityāgena parispandetaraprayogaja-paryāyasvabhāvah parināmāḥ*, TS., Bhā. TI, V. 22, p. 350.
4. *The Positive Sciences of the Ancient Hindus*, p. 121; molar (A)=having power to grind. (N) Back teeth.
5. *The Positive Sciences of the Ancient Hindus*, p. 121.
6. *Sarvalokaparispandanaṁ*, Śaṅkara,
Vide *The Positive Sciences of the Ancient Hindus*, p. 121.

and so on; but Ākāśa (ether) itself passes through two stages before the emanation of the sūkṣmabhūta vāyu : (1) the motionless ubiquitous primordial matter-stuff (answering to the Sāṃkhya Bhūtādi) called Purāṇam Kham, and (2) a subtle integration, the pure unquintuplicated sūkṣmabhūta called Vāyuram Kham, answering to the Sāṃkhya Tanmātra stage. It is this subtle Ākāśa, in its Tanmātric integration, i. e. in the derivative form, which is subject to an incessant Parispanda. The gaseous stage of matter (The Vedāntic Vāyu) is indeed matter in a stage of Parispandic motion.¹ So also the biomotor and sensori motor principles apart from the directive intelligence of the self.²

This parispanda is conceived also by the Sāṃkhya philosophy to describe every process and phenomenon of cosmic evolution.³ “Bhūtas, organisms, mental organs, as modes of Prakṛti (considered apart from the Intelligence of Puruṣa), are also subject to this Parispanda.”⁴ But Prakṛti (the Primordial Matter) as the unmanifest ground can have no Parispandic motion⁵ (or mobility), though the action of evolution belongs to it. Here the question is how did the similarity of thought (vicārasāmya) come into both the Sāṃkhya and Jaina philosophies from evolution or transformation in regard to Parispandana. In the Sāṃkhya it is stated.

1. Vāyoḥ parispondātmakatvāt—Śaṅkara.
2. Prāṇasya parispondātmakatvād evayadadvaitāṁ sthūlam
sūkṣmaṁ ca tatsarvam manah sanditamātram—Śaṅkara,
Vide P. S. A. H., p. 122.
3. Vyaktāṁ sakriyāṁ parispondavat, Tattvakaumudi, 10,
Vācaspati Miśra.
4. Tathā hi buddhyādayo upāttamupāttam deham tyajanti
dehāntaram ca upādadata, iti teṣāṁ parispondah śarīra-
prthivyādInām ca parispondah prasiddha eva, Ibid.,
Vācaspati on Kārikā, 10.
5. Yadyapi avyaktasyāpi pariṇāmalakṣaṇa kriyā, tathāpi
parispondo nāsti. Ibid., on Kārikā, 10.

that there takes place evolution in all things except in the Sentient Principle (*Cetanaśakti*=*Puruṣa*), while Jaina Metaphysics maintains that both Matter and Soul undergo transformation. In the *Sāṃkhya*, there is stated to be the unmanifest and manifest conditions (*avyakta* and *vyakta avasthā*) of *Prakṛti* (Primordial Matter), while in Jaina Philosophy *Jīva* (Soul), *Dharma* (Principle or Motion), *Adharma* (Principle of Rest), and *Ākāśa* (Space) are unmanifest (*avyakta*). According to this philosophy, there is a state of *aparisandana* (non-vibration or non-mobility) of Soul (*Jīva*). The worldly soul and Matter possess *spandana* (vibration or rotatory motion). *Dharma* and *Adharma* are the efficient causes in the motion and rest respectively of the worldly souls and Matter.

The Jaina conception of *utpāda* (origination), *vyaya* (decay) and *dhrauvya* (permanence)¹ of the reals corresponds to the *Sāṃkhya* view of *parināma* (transformation) of *Prakṛti* or of all things. According to Jaina philosophy, there continues *parināma* (transformation) in the liberated souls, the worldly souls and all forms of Matter. *Parispandana* (vibratory motion) takes place in Matter. In the unmanifest stage of *Prakṛti* there is a state of equilibrium (*sāmyāvasthā*). The *sadrśapariniāma* (evolution of like to like) of the *Sāṃkhya* corresponds to the *arthaparyāya* of Jaina metaphysics which takes place in all substances—Soul, Matter, etc. The *Sāṃkhya* maintains that when the disturbance occurs in the state of equilibrium of *Prakṛti*, it becomes manifest, i. e. *parispandana*. In the Jaina tradition the principle of *utpāda* (origination)—*vyaya* (decay) *dhrauvya* (permanence) is *parispandana* (vibratory motion). Soul is *aparisandanātmaka* (non-vibratory), but not so is *kriyā* (activity) of Matter. In regard to these *parispandana* and *aparisandana* of Matter it appears that the Jaina and *Sāṃkhya* views are one at the root of speculation about this problem.

According to the *Nyāya-Vaiśeṣika*, *parispanda* is found in

1. *Utpādavyayadhrauvyayuktam sat*, TS., V. 29.

all forms of Matter except in Ākāśa (space) which is conceived as non-atomic and inactive. All the four classes of atoms, viz. air atoms, fire-atoms, water-atoms and earth-atoms are in continual motion. The universe at bottom is an infinitude of unceasingly vibratory particles.¹ "All physical action consists in motion."² Force, power and operation (śakti) are recognized by this philosophy as only the modes of motion. It is said by Jayanta Bhāṭṭa that no mysterious power or operation which is not and cannot be apprehended by the senses is acknowledged. "But this denial of force (śakti) and of unperceived and unperceivable operation (atīndriyavyāpāra) is advanced as the philosophical proposition to show the correctness of the Nyāya treatment of the causal nexus to mere invariable and unconditional antecedence among phenomena without productive power of efficiency."³ Parispanda is of the nature of motion and is the ultimate form of activity in spite of its being subtle and hence infra-sensible (sūkṣma and anudbhutarūpa, not atīndriya).⁴ It is explained that an effect is the total outcome of the combined motions of the various (material and efficient) causes involved in all cases of material causation, e. g. in the case of chemical action (pāka).⁵ Sa

1. Anavarataparispandamānaparimitapavanādiparamāṇavah,
Raghunāth;

compare also paramāṇavah in gatiśīlatvāt patatravya-padeśah patantīti, Nyāyakusumāñjali, Stavaka. V.

Vide The Positive Sciences of the Ancient Hindus, p. 122.

2. The Positive Science of the Ancient Hindus, p. 123.

3. Anyathāsiddhiśūnyasya niyatapūrvavarttitā, Bhāsāpariccheda, Vide The Positive Sciences of the Ancient Hindus, p. 123.

4. Parispandana eva bhautiko vyāpārah karotyarthah atīndriyastu vyāpārah nāstīti brūmaha tasmat kārakacakreṇa calatā janyate phalam na punaścalanādanyo vyāpāra upalabhyate, NM., Āhnika, I, p. 18.

5. e. g. in the case of pāka, samuditadevadattādisakalakāra-kanikaraparispanda eva viśiṣṭaphalāvacchinnah pāka ityu-

all action of matter on matter is converted into in this way, just as it is found in Jaina philosophy.

The basic difference between the Nyāya-Vaiśeṣika and the Sāṃkhya-Vedānta on Parispandana (vibratory motion) is this that the former maintains that the conscious activity is sharply distinguished from all forms of motion, according to the former, while the latter considers everything except Intelligence, Puruṣa (the transcendental Self) to emerge in "the course of cosmic evolution, and hence to be subject to pariapandic motion."¹

It is to be noted that the Mīmāṃsakas accept śakti (power), while the Naiyāyikas reject it. But the Jainas accept power in an entity. In Jaina philosophy Matter and Soul are stated to be active, while the Principles of Motion and Rest and Space are called inactive.² That is, the Principles of Motion and Rest and Space cannot make movement like 'reaching' another place from one place as a result of motion. The denial of the universal activities like origination, decay, etc., is not meant here in the aphorism "Niṣkriyāṇi ca".³ Origination and decay of arthaपaryāya (unceasing modification) take place in them. Soul also is inactive by nature because it is aparispanda-nātmaka (non-vibratory). Due to no-karma (quasi-karma) parispandana (vibratory motion) occurs in the elements of Soul

cyate ... atha vyāpāra evaīsaḥ sarvvaḥ sambhūya sādhyate
kim phalenāparāddham vāḥ taddhi sambhūya sādhyatām
NM., A. 1, p. 18.

1. Kriyāviśesa evāyam vyāpāto jñātarāntaraḥ spandātmaka-bahirbhūtakriyālakṣaṇavilakṣaṇaḥ, Quoted in NM., A. 4. Vide, P. S. A. H., p. 123.

2. Niṣkriyāṇi ca, TS., V. 6, p. 326.

3. Pudgalajīvavartiv yā viśeṣakriyā deśāntaraprāptilakṣaṇa tasyāḥ pratiṣedho ayam, notpādādisāmānyakriyāyāḥ, TS., p. 327.

Pudgalāstvito deśāntaramāskandantaḥ samupalabhyante jīvāścetyataste kriyāvantāḥ, Ibid.

by the relation of karmic body with it, for this reason it has been called active (*kriyāvanta*).¹

On the disjunction (or dissociation) of the karmic body as a result of the destruction of eight kinds of Karma, Soul becomes non-vibratory (*aparispondanātmaka*). There takes place the upward motion of Soul when it is released from the karmic body.² It reaches the Siddhasthāna by that motion.³ The *parispandanātmaka kriyā* (vibratory activity) like contraction and expansion of pradeśas (elements) of Soul, which occurs in it, is produced by the previous action. In the worldly souls there is happening at every moment artha paryāya like origination and decay of infinite knowledge, self-awareness, energy and unthinkable experience of happiness. Soul cannot attain liberation as long as it is active because the relation of Soul with Matter continues as long as its acts.⁴

Kriyā (activity) is stated to be endowed with the characteristic of *parispandana* (vibratory motion or oscillation).⁵ Motion is the nature of Matter; activity takes place in it due to the nature of *parispandana* (vibratory motion); it is capable of activity by its capacity of *parispandana* (vibratory motion).⁶ Therefore, it is endowed with activity. It is active by its own capacity.⁷ Internally activity is associated with the changing

1. Kārmaṇa-śarīrālambanātmapradeśaparispondarūpa kriyā, T ŚI., 2. 25, p. 331.
2. Tadanantaramūrdhvam gacchatyā lokāntāt, TS., 10.5, p. 298.
3. Pūrvaprayogād asaṅgatvā d, bandhacchedāt, tathāgatipari-
nāmācca tadgatiḥ, TS., 10.6.
4. Jāva caramāṁ Bhaṁte ayam jīve eyati veiyati calati phām-
dati tāyam caramāṁ nāñāvaraṇijjenām jāva antarācena
bajjhavimti ? haṁtā Goyama ! BhS., 3.3.153.
5. Parispandalakṣaṇā kriyā, PPV, p. 182.
6. Ibid.
7. Sāmarthyātsakriyau jīvapudgalāviti niścayaḥ jīvasya ni-
kriyatve hi kriyāhetutā tanau; T ŚI 5.7.2, p. 398.

capacity (capacity of change). Matter is not by any means non-motive, static and inactive. It is not true that Matter is active in all fields (*kṣetras*), at all times (*kālas*) and in all conditions (*bhāvas*). Sometimes it is active and sometimes it is inactive.¹ Having remained immersed in one space-point, it vibrates or oscillates or makes revolving motion.² Activities made by vibration are not continuous; it is accidental.

There can be infinite divisions of activity with regard to infinite modes. Generally, there are stated to be many divisions of activity (*kriyā*)³, but from the particular point of view there can be the following divisions of it with regard to nimitta (cause), applied (*prāyogika*) and natural (*vairasika*) processes and its own form (nature), i. e. motion in one place and motion to another place, and integration and disintegration (*bandhabheda*). In the Jaina Āgama Bhagavatī Vyākhyāprajñapti the word 'eai' (to vibrate or to oscillate) has been used to stand for motion in one place (space-point). There are stated to be two kinds of *kriyā* (activity or movement), viz. samita (limited) and vividha (various).⁴ A few kinds of motion for reaching another place are described below :

(1) *Anuśreṇi* and *viśreṇi* (motion in a line and motion out of lines), *avagraha* (non-curvilinear-motion or motion in non-curved line) and *vigraha* (curvilinear motion or motion in curved line) and *rūḍgati* (motion in straight line) and *kuṭila gati* (complex or crooked motion).

(2) *Pratighātin gati* (impeded or resisting motion) and *apratighātin gati* (unimpeded motion).

1. *Paramāṇupoggale siya eyati, veyatī, jāva pariṇamati, siya no eyati jāva no pariṇamati*, BhS., 5.7.213.
2. *Egapaesogādhe poggale see tammi vā ṭhāne, annammi vā ṭhāne jahaṇṇenām egam samayaṁ, ukkosenām āvaliyāe asamhkejjaibhāgaṁ ciraṁ*, BhS., 5. 7. 215.
3. *Pudgalānāmapi dvividhā kriyā visrasā-prayoganimittā ca, TRV., 5.7.17.*
4. *BhS., 3.3.153 (comm).*

(3) Spṛṣṭa gati (touching motion) and aspṛṣṭa gati (non-touching motion).

(4) Īrddhagati (upward motion), adhah gati (downward motion) and tiryag-gati (horizontal motion).¹

Some kinds of kriyā (movement or activity) of the worldly souls or beings have been described in the following manner :

(1) samiaṁ eai (samita kampana=limited vibration), (2) veai (vividha kampana=various vibrations or oscillations), (3) calai (calana-gamana=going), (4) phandaei (spandana=pulsation or oscillation), (5) ghāttai (saṁghāta=striking or colliding or friction or sudden pushing), (6) khuvvai (prabalatā-pūrvakapravesa=forcible entry), (7) udīrai (pravalatā-pūrvakapreraṇa=padārthāntara-pratipādana=the act of throwing).²

Some of the rules of gatikriyā (motion-activity) are given below :

(1) Anuśrenigati (linear motion or motion in a straight line), (2) (a) ekasamayavigraphagati (curved motion for an instant) and (b) lokānta prāpiṇigati (motion upto the last border of the Universe), (3) paramāṇeraniyatā (movement of ultimate atom), (4), (a) cālajaghanya (minimum movement of an ultimate atom from one space-point to another in one samaya=instant), (b) utkṛṣṭagati (maximum movement from one last border to another in one samaya=instant), (5) kampanakriyā-kāla (duration or time of vibration or oscillation—(a) minimum for one samaya, (b) maximum for innumerableth part of āvalikā, and (6) niṣkriyakāla (time or durations of non-vibration or non-oscillation)—(a) minimum for one samaya, (b) maximum for countless samayas.

According to the rule, the deśāntaraprāpiṇigati (motion from one place to another) takes place in a straight line. But on account of prayogapariṇāma (the applied process of trans-

1.. TS Bhā., 2.27-29, pp. 180-82.

2. Bhs. 3. 3. 153.

formation) it takes place out of the straight line.¹

MOTION IN THE NYĀYA-VAIŚEṢIKA PHILOSOPHY

In the Nyāya-Vaiśeṣika "motion is characterized as the unconditional cause of conjunction and disjunction."² The four material substances, viz. earth, water, fire and air, are capable of motion because of having limited magnitude. According to this philosophy, motion is instantaneous (*kṣaṇika*) and unproductive of another motion (*svajātśyānārambhaka*).³ The Vaiśeṣika maintains that every material object moving in a particular direction must by necessary implication possess the quality of impulse (*vega*),⁴ which makes the continuity of its motion in the same direction possible. The quality of impulse is produced in a moving body by its first unit of motion, and so long as the impulse of the body is not neutralized by some other force, it will continue to move in the direction of its original motion.⁵ Impulse is a type of quality of *sāṃskāra*. It is produced from one motion and leads to an other, just as the mental impression is the product of a previous experience and the cause of a subsequent one, viz. recollection.⁶ In regard

1. *Anuśrenigatiḥ*, TS., 2.27, p. 180;

Sarvā gatirjīvānām pudgalānām cākāśapradeśānuśrenir-bhavati, viśrenirnabhavatītī gatiniyama iti, Ibid. Bhā. p. 181; *Avigrahā jīvasya*, TS., 2. 28; *Vigrahavatī ca samsātiṇah prāk caturbhyāḥ*, TS., 2. 29, p. 182.

2. *Ekadravyamagunaṁ satyayogavibhāgesyanapekṣakāraṇamiti karmalakṣaṇāṁ*, VS., 1. 1. 17.

3. PPBhā., p. 290, *Guṇapadārthaṇirupaṇam*,

4. *Ibid.* 5. *Ibid.*, p. 266.

6. *Sāṃskārastrividhāḥ vego bhāvanā sthitisthāpakaśca tatra vego müttimatsu pañcaśu dravyesu nimittaviśeṣāpekṣat karmano jāyate niyatadikkriyā prabhandhahetuḥ sparśavadravyasamyoγa-viśesa-virodhi-kvacit kāraṇaguṇapūrvakramotpadyate*, PPBhā., p. 646.

to motion one point is common to both Jaina and Nyāya-Vaiśeṣika systems of thought that the material substances having limited magnitude are capable of motion.

OSCILLATION IN THE PHYSICAL SCIENCES

In the physical sciences oscillations of elastic bodies, e. g. the moving piston, the crankshaft, the tree swaying in the wind, the heart beat, the motion of planets, and many others, represent parisandana of Jaina Metaphysics, while motion of modern physics corresponds to gati of the latter. According to the physical sciences, motion is the change of position of a body with them. Absolute rest is unknown, for there is no stationary point in the Universe. Everything is in motion, though one object may be at rest in relation to another. Hence there cannot be absolute rest. Rest is here relative rest; an object is at relative rest with respect to another when it does not change its position in relation to the latter. As for example, kites flying in the sky in a formation are at a relative rest in relation to each other in their continuous motion. All motion is relative and the motion of a body involves a change of its position with respect to some known object, as there is no such fixed point in nature. There are stated to be many kinds of motion in the physical sciences. The uniform circular and pendulum motions among them are a class by themselves, while all others terminate, or take a body farther and farther away from its starting point.¹ In the cases of circular and pendulum motions the path of a particle is continually retraced after a definite period of time, they are called periodic motion.² The simplest of all periodic motions are those performed by elastic bodies. The instantaneous displacements of the parts of an elastic body, when plotted against the time yield sine or cosine curves, are called harmonic curves. In general,

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1. It is the desāntaragati of Jaina Metaphysics.
 2. It can be compared with ekasamayavigrahagī, etc.

harmonic motion, may be a composite one in which several periods are present simultaneously. In the presence of a single period the motion is called simple, harmonic motion. Besides, there are stated to be two kinds of motion, viz. translatory and rotatory or both simultaneously. Translatory motion is subdivided into rectilinear and curvilinear motions. Translatory motion takes place in a body when it moves in such a manner that there occurs also such identical motion in its constituent parts that "the line joining any two points of the body always moves parallel to itself when body is in motion. That is, the distance traversed by one point is equal and parallel to the distance traversed by the other point according to the rule that all the points in the body have identical straight line motion, e. g. vertical motion of rain drop or stones from a height, the running of the train on straight rails, the motion of a bullet from a gun." This translatory motion of the physical sciences compares well with the *anuśreni gati* of Jaina Metaphysics.

The motion of translation taking place along curved line in the way that any line in the body remains parallel to itself is known to be a curvilinear motion, e. g. the motion of an automobile or of a train rounding a curve. This curvilinear motion corresponds to the *viśrenigati* of Jaina Philosophy. Rotatory motion takes place when a body turns about a fixed point of axis, e. g. the whirling motion of a stone tied at the end of a string held in the hand. The motion which involves both rotation and translation of an object is called a complex motion resulting from the combination of rotation and translation, e. g. the rolling down of a banking aeroplane in its curved flight in the sky. The *vigrahagati* and *kutīlagati* of Jaina Metaphysics may be compared to the rotatory and complex motions of the physical sciences respectively.

It can be said from the above analysis of motion that in both Jaina Philosophy and modern physics the motion of a body is specified by its successive positions in time. Both of them study motions taking place along a straight line as well

as a curved line, a uniform horizontal motion and a vertical motion of free fall. Jaina Metaphysics goes deep into the problem of motion of matter in all its subtlest forms over and above the translatory, curvilinear, rotatory and complex motions of the physical sciences, as it is suggested by a brief outline of this subject.

SIXTH CHAPTER

EFFECTS AND MODIFICATIONS OF MATTER

FIRST SECTION

EFFECTS OF MATTER

As pointed out previously, according to Jaina metaphysics, Matter exists in Nature, occupying some volume in perceptible and imperceptible conditions within the sensuous and supersensuous experiences in various forms of modifications. Its effects appear as six kāyas, viz. pr̄thivikāya (earth-embodiment), apkāya (water-embodiment), tejakāya (fire-embodiment), vāyukāya (air-embodiment), vanaspatikāya (plant-embodiment or vegetation) and trasakāya (embodiment of mobile beings).¹ and śarīra (gross organic body), vāk (speech or voice), manas (mind) and pr̄añāpāna (respiration), while its manifestations are found to exist in the forms of śabda (sound), bandha (union or combination), saukṣmya (fineness), sthaulya (grossness), saṁsthāna (shape), bheda (division), tamas (darkness), chāyā (shadow), ātapa (heat, sunray) and udyota (cool light, moonlight).² It is to be noted that tamas (darkness), chāyā (shadow), ātapa (sunshine or heat) and āloka instead of udyota (moonlight, cool light), have also been accepted as bhautika (material) or rūpa (matter) in the Vaibhāṣika school of the Buddhists on the ground that they are apprehensible to the sense of sight with colour and shape (varṇa and saṁsthāna).

1. BhS., 24. 12. 21. 702-707 ff; 25.4. 739; GS., Jīvākāṇḍa, 182; Śarīravāṇimanaḥpr̄añāpānāḥ pudgalānām, TS., V. 19, p. 341.

2. Sabda-bandha-saukṣmya-sthaulya-saṁsthāna-bheda-tamaschāyātāpodyotavantaśca, Ibid., V. 24., p. 356.

Kāya (Embodiment) : It is caused by the operation of Karmas which make the bodies of the mobile and immobile beings. They are inseparably connected with the genus (*jāti*)—(body-making karma).² As mentioned above, it is of six kinds, viz. earth-embodiment upto the embodiment of mobile beings.³ In the physical sciences also they are regarded as the effects of Matter. Bodies (or embodiments) of earth, water, fire, and air-bodied souls exist (i. e. are formed) by the operation of the earth, water, fire, and air-body-making karmas as a rule with their respective suitable qualities like colour, taste, smell, touch, etc. and materials.⁴

Having taken into consideration the four kinds of each of the above four embodiments (effects) of Matter, the following divisions are mentioned, viz. (1) earth in general (*sāmānya-prthivī*), (2) earth-soul (*prthivī-jīva*), the soul which is in transmigratory passage, *vigrahagati*, immediately before being born as earth-bodied, (3) earth-bodied soul, the soul which has taken up an earth-body (*prthivī-kāyika*), and (4) earth-body (*prthivī-kāya*). Water, fire and air also are of four kinds, just as earth is described. That is to say, the effects—earth water, fire and air, etc., having the qualities of colour, taste, smell and touch, undergo transformation into bodies (*kāya*) by the operation of the *nāma-karmas*, such as, *prthivi-nāma-karma*, etc.

Here *karma* is energy, which is the attenuated form of matter. According to the physical sciences, “energy, like

1. Vaibhāṣikadarśana, pp. 67-8;
Ātapaḥ uṣṇapratkāṣṭah sūryasya, ālokaḥ śīlaprakāṣṭa indoḥ
Abh., K. 1. 10, Rāhulavyākhya.
2. Jai avinābhāvitasathāvara-udayajo have kāyo.
3. So jīnamadamhi bhaṇio puḍhavikāyādi chabbheyo, GS.,
Jīvakāṇḍa, 181.
4. Puḍhavi āuteūvāyukammodayena tattheva
Niyavaṇṇacaukka judo tāṇam deho have nīyamā, GS.,
Jīva., 182.

matter, is something which exists in Nature, though in different kinds. It pervades throughout this universe, but it has no bulk to be perceived by our senses. It has also no weight and knows no extension or compression.”¹ It is to be noted that “work, whatever be its nature, can never be produced without expenditure of energy. Energy is, therefore, defined as the cause of work. So, energy and work are synonymous, i. e. what is energy is work and what is work is energy.” For this reason “energy is qualitatively measured by work. As work may be of various types, the corresponding energies are differently named, depending on the type of work. The main divisions of energy are mechanical energy (energy possessed by matter on account of position, configuration or motion), heat-energy, sound-energy, light-energy, magnetic-energy, and electric body,”² i. e. they are the modifications of matter. “Each one of them is transformable into any other form or forms and this shows the ultimate identicality between different kinds of energy.”³

The bodies of the *pr̥thivī-kāyika-jīva*, etc., are gross or fine due to the operation of gross and fine-body-making karma respectively. As indicated before, a body which resists another body or is resisted by another one is called gross impenetrable body (*ghāṭaśarīra*), while that which does not resist another body nor itself is resisted by another one is called fine body, e. g. X-Ray or *Kārmaṇa-śarīra*. Their bodies are equal to the extent of innumerableth part of a cubic finger. Gross bodies require support, but fine bodies need no support and exist everywhere in the Universe with nothing intervening between them.⁴

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1. Int. Physics, S. C. Ray Chowdhury & D. B. Sinha, Calcutta, 1952, p. 2
 2. Ibid., pp. 2-3.
 3. Ibid., p. 3.
 4. Bādarasuhumudayēṇa ya bādarasuhumā havam̄ti taddehā Ghādasarīra thūlam̄ aghādadeham̄ have suhumāṇi; GS., Jīva., 183.

VANASPATIKĀYA (VEGETATION OR PLANT-BODY)

Souls become plant-bodied by the operation of the plant-body-making nāmakarma (energy). They are classified into two groups, viz. pratyeka (one body-one soul) and sāmānya or sādhāraṇa (general or common, i. e. one body, many souls). It is called pratyeka when the owner of one body is one soul. The body in which many souls exist is called sādhāraṇa (common body). Individual (body) is sub-divided into pratīṣṭhita (host with common parasites) and apratīṣṭhita (non-host without parasites).¹

Every plant is of two kinds, viz. pratīṣṭhita and apratīṣṭhita. The pratīṣṭhita is that in which many nigoda jīvas (minute germs of life) exist besides the existence of one soul as principal in it. The apratīṣṭhita is that body where many nigoda jīvas do not exist under one single principal soul. The vegetables which grow from a root (mūla), from the shoot (agra) of a plant, from a joint (parva), from a bulb (kanda), from trunk (skandha), from seed (bija) and vegetables which have no such seed as root, etc., (i. e., saṁmūrcchima) have been declared (to be) individual with host bodies (pratīṣṭhita pratyeka) or without them (non-host-apratīṣṭhita), e. g. ginger, rose-plant, sugarcane, potato, wheat, grass, etc.²

NIGODAŚARĪRA (MINUTEST BODY)³

The nigoda-śarīras become group-souled or gross (bādara-

1. Udaye du vaṇapphaḍikammasa ya jīvā vaṇapphaḍī hoṁti Patteyam sāmaṇṇatū padītthidiretti patteyam, GS., Jīva., 185.
2. Mūlaggaporabjā khamdā taha khamdhabiṣjābijaruhā Saṁmūrcchimā ya bhaṇiyā patteyāṇam̄takāyā ya, Ibid., 186.
3. BhS., 25. 5. 749; Jainasiddhānta-bolasamgraha, Pt. II, pp. 19-21;

Anantānāmasumatāmekasūksmanigodhinām Sādhāraṇam̄ śarīram̄ yat sa nigoda iti smṛtaḥ, Lokaprakāśa, Sarga 4.33; See Jaina Jñāna Mahodadhi, pp. 33 ff; Jīvābhigama, 5. 233.

nigoda) by the operation of the common-body-making karma. They are of two kinds, viz. gross and fine (bādara and sūkṣma).¹ In that common body when a soul dies, there takes place the death of infinite souls (with it) and when one is born, there occurs the birth of infinite souls in it.² In one human breath (respiration) a soul existing in a nigoda body takes birth and dies a little more than seventeen times.³ The maximum period for the existence of a nigoda śarīra is stated to be innumerable crore multiplied by crore sāgaras. The body of group-souled vegetables (bādaranigodas) are innumerable times more than the spatial units of the Universe.⁴

Trasakāya (Body of mobile beings)

All the bodies of the mobile beings are called trasakāya. Those souls which exist in the Universe with two, three, four or five senses should be known as mobile-bodied.⁵

Śarīra (Gross organic Body), Vāk (Organs of Speech), Manas (Mind) and Prāṇāpāna (Respiration)

Matter forms the physical basis of the organic body, the organs of speech, mind and respiration⁶ of beings. Forms of Matter are necessarily the auxiliary causes in the formation of body, etc; they also affect each other.⁷ There are stated to

1. Sāhāraṇodayena nigodasarīrā havamīti Tē puna duvihā jīvā bādarasuhumātti viṇṇeyā, GS, Jīva., 191; Ni-niyatām gām bhūmīm, kṣetram, nivāsamantanānta-jīvānām dadāt ti nigodām (That, which is always, is these-a body of infinite souls is called Nigoda).
2. Jatthekām marai jīvo tattha du marañām have aṇamītānām Vakkamaṭ jattha ekko vakkamaṇām tatthāṇāmītānām, GS., Jīva, 193. 3. Ibid.
4. Vihi tihī caduhi pāmcāha sahiyā je imītiehi loyāmhi Te tasakāyā jīvā neyā vīrobadasēṇa, GS., Jīva, 198.
5. BhS., 24, 17-21 708-712; TS., V, 19.
6. GS., Jīva, m 606.
7. BhS., 25.4. 738; Audārikavaikriyikāhārakataijasakārmanāṇī śarīrāṇi, TS., ch. II. 37, p. 195, See its Bhāṣya.

be five kinds of body of the worldly beings,¹ viz. audārikaśarīra, vaikriyikaśarīra, āhārakaśarīra, tajasaśarīra and kārmaṇaśarīra. (1) That which is born from the womb of mother is called audārikaśarīra (organic body of men and animals), (2) That which is possessed by the celestial beings or infernal beings, invisible to the sense of vision and capable of transformation in shape or size is called vaikriyikaśarīra (transformation body), (3) A subtle body which is developed by the highly spiritual yogins and can be thrown or impelled to great distances on special occasions is called āhārakaśarīra, (4) Tajasaśarīra is an electric or luminous body the existence of which has been established by the scientific experiments, (5) Kārmaṇaśarīra is the inner subtle body which forms the basis of all mental and physical activities. It corresponds to the liṅgaśarīra (subtle body) of the Sāṃkhya Philosophy. It accompanies Soul from birth to birth and it keeps Soul bound to the confines of the Universe because of the gravitational forces of matter encircling it on all sides. On the destruction of Karma-pudgala (karmic matter), Soul as a perfect eternal substance moves on fast with an impulse to the Siddhaśilā and exists there in its perfect state by attaining liberation.

Only the audārikaśarīra (organic body) is perceptible to the senses, as it is gross, whereas the other four are the subtle bodies; the one is subtler than the other by a gradual order,² but they are all corporeal.³ The first one is gross. The transformable body is finer than the gross one, the translocation-body is still finer than the transformable one. The luminous or electric body is still finer than the translocation or projectable body. And the karmic body⁴ is still finer than the luminous or elec-

1. BhS., 25. 4. 738; TS., II. 37.

2. Parām param sūkṣmām, TS., 2. 38.

3. Ibid.

4. Teṣāmāudārikādiśarīrānām param param sūkṣmām veditavyam tadyathā audārikādvavaikriyam sūkṣmām vaikriyādāhārakam āhārakāttajasam tajasāt kārmaṇamititi TS., Bhā., 2. 38.

tric body. Prior to the luminous body, each has innumerable times the number of space-points of the previous one.¹ That is, "the transformable body has innumerable times more than the number of space-points of gross organic one. The translocation body has innumerable times more than the number of space-points of the transformable one. The extent of the multiplying term is one/innumerable part of a palya. If so, the bodies must be successively greater in size. No. There is no difference in size owing to the nature of arrangement of structure, as in the case of heap of cotton and a ball of iron."²

"The last two (taijasa and kārmaṇa) have infinitefold (space-points).³ The luminous body is infinitefold in (space-points), when compared with the translocation body. And the karmic body is infinitefold in space-points, when compared with the luminous body.⁴ The last two (taijasa and kārmaṇa-śarīra) are non-resisting (without impediment),⁵ i. e. there is no impediment for these two types of bodies, as these are of a fine nature,⁶ they can move upto the last border of the universe without resistance. Just as heat enters a piece of iron, the luminous and karmic bodies meet with no impediment in their transit through adamantine sphere etc. Now, there is no impediment for the transformable and the translocation bodies also. It is true. But there is a difference. In the case of the last two bodies, there is no impediment anywhere upto the end of the

1. Pradeśato asamkhyeyagunām prāktaijasāt, TS., 2. 39, p. 197.
2. Teṣāṁ śarīrāṇां param parameva, pradeśato asamkhyeyagunām bhavati prāk taijasāt, audārikaśarīrapradeśebhyo vaikriyaśarīrapradeśā asamkhyeyagunāḥ vaikriyaśārīrapradeśebhya āhārakaśarīrapradeśā, asamkhyeyagunāḥ—TS. Bhā., 2.39, p. 197; SS., 2.38 (Comm).
3. Anantaguṇa pare, TS., 2. 40, p. 198.
4. Sarvārthaśiddhi, 2.39; TS. Bhā., 2.40.
5. Apratighāṭe, TS., 2.14, p. 199.
6. Ete dve śarīre taijasakārmaṇe anyatra lokāntāt sarvatrāpratighāṭe bhavaḥ, TS. Bhā., p. 199; SS.; 2.40 (comm).

universe. But it is not so in the case of the other two, namely, the transformable and translocation bodies.”¹

The taijasa and kārmaṇa śarīras (bodies) are of beginning less association.² “The association is beginningless as well as with a beginning. From the point of view of the series of cause and effect, the association is beginningless. From the particular point of view, it is also with a beginning as in the case of the seed and the plant. The gross, transformable and translocation bodies are associated with Soul at some time or other. But the luminous and karmic bodies are not so, on the other hand, these two are associated with Soul till the attainment of liberation.”³ These two bodies are possessed by all the transmigratory souls.⁴ Some Ācāryas⁵ maintain from the stand-point of Nayavāda (consideration of one aspect of a thing) that there is a beginningless relation of the worldly souls with kārmaṇaśarīra only, but not with the taijasaśarīra, because of its production from labdhi (mental faculty) commencing with the luminous and karmic bodies, upto four bodies can be had simultaneously by a single soul.⁶ The karmic body is not the means of enjoyment.⁷ The gross body is of uterine birth and spontaneous generation.⁸ The transformable body originates by birth in aupapāda⁹ (heavenly special birth-beds); attainment is also the cause of its origin.¹⁰ The luminous body

1. SS., 2.40 (Comm).

2. Anādisambandhau ca, TS., 2.42; Tābhyaṁ taijasakārmaṇā-bhyāmanādiḥ sambandhaḥ iti, TS. Bhā., p. 200.

3. Sarvārthaśiddhi, 2.41.

4. Sarvasya, TS., 2.43., p. 200.

5. Ibid.

6. Tadādīni bhājyāni yogapadekasyā caturbhyah, TS., 2.44, p. 202.

7. Nirūpabhogamantyam, TS., 2.45.

8. Garbhasarīmūrcchaṇajamādyam, Ibid., 2.46.

9. Vaikriyamaupapātikam, Ibid., 2.47.

10. Labhipratyayam ca, Ibid., 2. 48.

also is caused by attainment.¹ The projectable body, which is auspicious and pure and without impediment, originates in the saint of the sixth stage only.²

VĀK (SPEECH OR ORGANS OF SPEECH OR VOICE)

According to Jaina Philosophy, Vāk (Speech or Voice) is non-soul, corporeal, non-sentient and non-living material substance of the beings.³ The two-sensed beings and five-sensed beings receive matter by the sense of taste in the form of language, while the saṃjñin jīvas (those which possess consciousness to make a distinction between good and evil) receive infinite manovargaṇāyogyapudgalaskandhas (matters fit to turn into manovarganā = mind—dust—or particle) by manahparināma (mental transformation).⁴ In the medicinal science also speech is regarded as material. (It comes out of the larynx or the organ of voice which is triangular box of cartilage and muscles, situated below the pharynx and the root of the tongue. It presents a considerable projection at the upper and front parts of the neck externally. At the upper part of the larynx there is a lid of cartilage called the epiglottis.⁵ The voice is generated by forcing air from the lungs through the space between two stretched vocal chords which are stretched across the trachea with a narrow vocal slit between them, the edges of the slit acting as

1. Taijaśamapi, SS., 2.48 (Comm).

2. Śubham visuddhamavyāghāti cāhārakam caturdaśapūrvadharasyaiva, TS., 2.49.

3. Goyamā no āyā bhāsā annā bhāsā, rūvī bhāsā no arūvī bhāsā...no sacittā bhāsā acittā bhāsā, no jīvā bhāsā ajīvā bhāsa Jivānam bhāsā no ajīvānam bhāsā, BhS., 13.7.493.

4. Dvīndriyādayo jihvendriyasamnyogat bhāsātvena gṛhṇanti nānye, saṃjñinaśca manastvena gṛhṇanti nānya iti, TS., Bhā., p. 342.

5. Physiology, p. 82.

reeds. The two vocal chords (membranes) are attached to muscles by which their tension and vibration frequently can be altered. The edges of the membranes are set into vibrations like reeds by the air from the lungs and thus sound is produced, the pitch of which can be altered by altering the tension of the vocal chords, and the quality of which depends upon the air cavities of the nose, throat and mouth, which act as resonators, the shape and the size of which can be varied by the speaker at will.¹ It is similarly explained in the Bhagavati Vyākhyā-prajñapti that speech which is breaking forth, while speaking is speech, but not that which was spoken nor that which dies out after the crossing of the speaking time.²

There are stated to be two kinds of vāk (speech), viz. dravyavāk and bhāvavāk (physical and psychical speeches).³ Ācārya Pūjyapāda explains them in this way : There in the psychical speech is material, as it arises on the destruction-cum-subsidence (*kṣayopaśama*) of energy—obstructing karmas and sensory and scriptural knowledge—obscuring karmas, and on the rise of physique—making karmas of limbs and minor limbs. For in the absence of matter there can be no function of psychical speech. Matter prompted by the active soul endowed with this capacity takes the mode of speech. Hence physical speech is also material. Speech is the object of the sense of hearing.⁴ “It is perceived through the senses composed of matter, it is obstructed by material objects like the wall and the others, it is intercepted by adverse wind, and it is overpowered by other material causes.”⁵

In support of his predecessor Akalaṅka deals with the subject by explaining that psychical speech, being the effect (*kārya*)

1. Int. Physics. S. C. Ray, Chaudhury and D. B. Sinha, p. 571.
2. BhS., 13.7.493.
3. Vāk dvividhā dravyavākbhāvavāgiti, SS., p. 286; see Viśeṣāvaśyakabhāṣya, 336, 337, 351, 352, 353, 354, 375, 377; N. 5. 6, 8, 9.
4. SS., p. 286.
5. Ibid.

Matter, is material (paudgalik) from the point of view of cause (nimitta)¹. It is material, for it is the object of the auditory sense, just as the thunderbolt, sparkling once, is destroyed again and does not become perceptible to the sense of vision, just so speech, once heard, is not heard again because of being broken forth. Just as inherent colour, taste, etc., even existing in the apprehensible fragrant substance, is not apprehended by the prāṇendriya (vital organ), just so sound also is not apprehended by the sense-organs like eye, etc.³

MANAS (MIND)

Manas (mind) has been accepted by all the Indian systems of thought as the internal sense-organ. There is a difference of opinions among the philosophers in regard to many aspects of it, such as, nature, cause, function, character (dharma), place (sthāna), etc. The Vaiśeṣikas,² the Naiyāyikas⁴ and their followers, the Pūrvamīmāṃsakas,⁵ have conceived manas as aṇu (atomic), hence it is eternal, i. e. devoid of cause. The Sāṃkhyā-Yoga and their followers the Vedānta have not accepted it as aṇu; nevertheless, they have admitted it as atom-like and producible, as its origination takes place from ahaṅkāra,⁶ an evolute of Prakṛti or as avidyā. According to the Buddhist and Jaina philosophies, manas is all-pervasive, but not atom-like. Both these traditions accept it as having intermediate dimension and producible. The Buddhist philosophy maintains that manas (mind) is vijñānātmaka (consciousness-

1. Tannimittatvāt pudgalakāryatvādityarthah, RV., p. 469.

2. Punaragrahaṇam taṭiddravyavadasaṁhatatvāt, RV., p. 470.

3. Tadabhāvādaṇu manah, VS., 7. 1. 23.

4. Na, yugapadanekakriyopalabdheḥ...yathoktahetutvāccāṇu, NS., 3.2.57-59.

5. Prakaraṇapañcikā, p. 151.

6. Yasmāt karmendriyāṇi buddhīndriyāṇi ca sātvikādahaṅkārādutpadyante, mano'pi tasmādeva utpadyate, Māṭharavṛtti, kā. 27.

like) and it is the previous consciousness-like cause of the succeeding consciousness.¹ According to Jaina metaphysics, the physical mind is born of a kind of subtle-non-living substance called manovargaṇas (mind-particles) and it undergoes changes like the body at every moment, while the psychical mind, because of being characterized by the capacity of knowledge and being knowledge-like, is born of the sentient substance.²

All the Indian systems of thought hold the view that the function of manas is to causes the birth of the qualities like desire, hatred, pleasure, pain, etc., and their experience, whether these qualities exist in the soul or are of the intellect³ or self-evident, according to the theories of the Nyāya, Vaiśeṣika, Mīmāṃsaka and Jaina systems of thought, etc., or the doctrine of the Buddhist philosophy, respectively. Manas becomes the cause in the emergence of knowledge brought about by the external sense-organs and in the production of the qualities like knowledge, etc., which are born independently of the external sense-organs. According to the views of all the Indian Philosophies with the exception of the Buddhist view, the dharmas (characters or essentials) like desire, aversion, knowledge, pleasure, pain, impression, etc., do not belong to manas. The Vaiśeṣikas and the Naiyāyikas, the Mīmāṃsakas and the Jainas maintain that these qualities belong to Soul, but the Sāṃkhya-Yoga and the Vedānta hold the views that they belong to the intellect. The Buddhists have accepted manas

1. *Vijñānam prativijñaptih mana'ayatanam ca tat. saññāmanantarāttam vijñānam yaddhi tanmanah*, Abh. K., 16-17; *Tattvasaṅgraha*, kā. 631;
Abh. K., 1. 17 *Sphuṭārthā*, pp. 40, 41, vide Darśana and Cintana, p. 139.
2. *Tasmāccittasya dharmā vṛttayo nātmanah*, Sarvadarśana, pāta, p. 35.
3. *Tāmrapiṇiyā api hṛdayavastu manovijñānadhātorāśrayam kalpayanti*, Abh. K., *Sphuṭārtha*, p. 41, vide Darśana and Cintana, p. 140.

(mind) in place of the Principle of Self without regarding it as a separate entity, therefore, according to its view, all elements like desire, aversion, knowledge, force, etc. which are called ātmadharmas (essentials of soul) or antaḥkaraṇadharmas (essentials of internal sense-organ) by different philosophers are the elements of mind.

Some philosophies like the Nyāya-Vaiśeṣika and the Buddhist¹ accept manas (mind) as hrdayapradeśavartin (existing in the space-point of heart), while other systems of thought like the Sāṃkhya, etc., hold the view that the place of manas (mind) cannot be stated to be hrdaya (heart), because, according to their traditions, it is entering into the subtle body (lingaśarīra) which is itself a special body-like. It is known that the whole gross body should be accepted as the place of the subtle body; therefore, according to this tradition, the place of mind is decided to be the whole body. The Jaina tradition avers that the place of the psychical mind (bhāvamana) is Soul only. But there is found the difference of opinion in regard to the physical mind (dravyamana) among the Jainas. The Digambara tradition accepts the physical mind (dravyamana) as existing in the smallest point of the heart, while the Śvetāmbara tradition maintains that the whole gross body is stated to be the seat of the physical mind (dravyamana).²

So mind is of two kinds, viz. physical and psychical (dravyamana and bhāvamana). "The psychical mind characterized by the capacity (for comprehension) and consciousness is material, as it is assisted by matter. Similarly, owing to the destruction-cum-subsidence of knowledge-covering and energy-obstructing karmas and the rise of nāma-karma of limbs and

1. Abb. K. Sphuṭārthā, p. 41;

Vide Darśana and Cintana, p. 140.

2. Sarvārthagrahanāṁ tulanā, Pramāṇamīmāṃsā, p. 19, pañti, 10 Sarvārthopalabhaunendriyāni prabhavanti iti savyavisayamantaḥkaraṇāṁ manaḥ, NBhā., 1. 1. 9; SK., 35; SS 2-11 (comm); SS., 5. 19 (comm).

minor limbs, particles of matter transformed into mind assist the living beings tending to examination of good and evil, remembering things, etc. Hence the physical mind also is material. It is contended by others that mind is a different substance that it is bereft of colour (form), etc., and it is of the size of an atom. Hence it is improper to consider it as matter.”¹ This is the Vaiśeṣika view on the concept of mind. Ācārya Pūjyapāda refutes this contention by advancing the argument whether the mind is connected with the senses and the soul or not. “If it is not connected, then it cannot be of assistance to the soul, nor can it be of use to the senses. If it is connected, then the atomic mind connected with one point cannot leave that point and be of use to the other parts (of the soul or the other senses). Nor can it be said to rotate like the potter’s wheel on account of an invisible force, as there can be no such capacity. The invisible force (*adṛṣṭa*) is admitted to be the attribute of the non-material and inactive soul. Hence it is also inactive. Being inactive itself, it cannot be the cause of activity elsewhere. For instance, the wind is endowed with activity and touch, and it is naturally the cause of the wasting of plants and trees. But this invisible force is quite different from it and hence it cannot be the cause of activity.”²

Bhāvamana is *jñāna* (knowledge), which is the attribute of Soul, so it comes under Soul. “As the physical mind is characterized by colour, taste, smell and touch, it is a modification of matter. The physical mind is characterized by colour, taste, smell and touch, for it is the cause of knowledge like the sense of sight.”³

Having followed the footsteps of Ācārya Pūjyapāda, Aka-lanka also deals with the concept of mind by refuting the Sāṃkhya, Buddhist and Vaiśeṣika views regarding it in his

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1. Sarvārthasiddhi, V. 19 (comm.) Vide Reality, S. A. Jain p. 145.
 2. Sarvārthasiddhi, p. 287.
 3. Reality S. A. Jain. p. 131; Sarvārthasiddhi V. 3 (Comm)

own manner. He rejects the Sāṃkhya view of mind as the modification of the Prakṛti (Primordial Matter) by stating that when Prakṛti itself is non-sentient, then its modification also will be non-sentient, hence like jar, etc. it will not be able to perform the function like examining good or evil, remembering, etc. Mind is karaṇa (organ) of activity like thought. Then who will be the doer of this activity ? Whether is it Prakṛti or Puruṣa (Self) ? Puruṣa is attributeless, therefore, there cannot be the modification of Sattva (Essence) in it like thought, memory, etc. Prakṛti is non-sentient, hence there cannot be the sentient activities like thought, remembering, etc., in it also. Mahat (intellect), ahaṅkāra (ego), etc., the modifications of Prakṛti, are different from it, then the postulation of the identity of effect and cause stands refuted. If it is non-different, then there remains only Prakṛti from which no modification is possible at all. Therefore, they cannot become mind.¹

Next Akalaṅka refutes the Buddhist theory of mind which is conceived as separate entity called vijñānarūpa (pure consciousness-like), i. e. that which is upādāna-bhūtajñāna-kṣaya (material cause of past knowledge-moment) of cognitions is called mind (manas). But in the Buddhist view, when jñāna (knowledge) is momentary, it cannot apprehend the object at the present moment; then what is to speak of the previous knowledge ? When the present knowledge does not maintain any relation with the prior and posterior consciousness, then how can it examine good and evil, remembering, etc. ?

Recognition of an object experienced by oneself is made by one who has seen it in the past, but there is no possibility of the recognition of the object experienced by others or that of the object unexperienced by himself. In the case of the advocates of momentarism this succession of remembrance (recognition) cannot take place. Santāna (issue or continuity) is non-substantial. Therefore, with regard to it there is no rational

1. Pradhānavikāra iti cet, na; acetanatvät, TRV., V. 19 (comm.), p. 478.

ground for making the possibility of remembrance, etc. When pūrvajñānarūpamana (previous knowledge-like mind) is non-existent at the present time, then how can it perform the functions like examining good and evil, remembering, etc.? If the seed-like store-house of consciousness (ālayavijñāna) is accepted as permanent, then the doctrine of momentariness stands refuted. If it is momentary, then it cannot also be the support of remembrance, etc.¹ Akalaṅka has followed the same procedure of his predecessor Ācārya Pūjyapāda for refuting the Vaiśeṣika view of mind.²

In modern psychology mind has been conceived as physical and psychical, just as it is accepted in Jaina Philosophy, as the evolution-theory demands and mind-dust.³ William James makes "the assumption that our mental states are composite in structure, made up of smaller states conjoined."⁴ "Theory of 'mind-stuff' is the theory that our mental states are compounds, expressed in its most radical form."⁵ "Each atom of the nebula...must have had an aboriginal atom of consciousness linked with it; and just as the material atoms have formed bodies and brains by massing themselves together, so the mental atoms, by an analogous process of aggregation, have fused into those larger consciousness which we know in ourselves and suppose to exist in our fellow-animals."⁶ So according to this doctrine of atomistic hylozoism, "there must be an infinite number of degrees of consciousness, following the degrees of complication and aggregation of the primordial mind-dust."⁷ This mind-dust can be compared well with

1. Vijñānamiti cet, na; that sāmarthyābhāvāt (32),

RV., pp. 472-3.

2. RV., pp. 471-472.

3. The Principles of Psychology, pp. 145, ff.

4. Ibid., p. 145.

5. Ibid.

6. Ibid., p. 147.

7. Ibid.

manovargaṇās, which constitute manas (mind) as conceived in Jaina Metaphysics. The comparative study of these brief outlines of the Indian concepts of mind reveals that the Jaina concept of mind has made a synthetic approach to this problem from the physical and psychical points of view like modern psychology.

PRĀNĀPĀNA (RESPIRATION)

Prānāpāna (respiration) is material. Ācārya Pūjyapāda explains the point in this manner "The soul wishing for the destruction-cum-subsidence of energy-obstructing karmas and the rise of nāma-karmas of limbs and minor limbs, exhales air from the lungs, and it is called the breath of life (prāṇa). The same soul inhales air from the atmosphere and it is called the breath of inhalation (apāṇa). Thus these also are helpful to the soul, as these enable the soul to live."¹ The exhaled air and inhaled air must be understood to be material. They meet with resistance, etc., by objects. Respiration is obstructed by covering the face with the palm or cloth. It is also obstructed by phlegm. But a non-material substance cannot be obstructed by material objects.

In the medical science also the Jaina view of the material nature of respiration is fully supported. The respiratory apparatus consists of the larynx, trachea, bronchi, lungs and pleurae.² When one breathes in air, it goes through the trachea and bronchi to the air-sacs of the lungs, which are surrounded by blood capillaries. "According to the property of diffusion the oxygen inside the alveoli and the carbon dioxide in the capillaries interchange themselves through the thin membranes. As the oxygen inside the alveoli is taken by the blood, the air inside the lungs must be renewed to bring in a fresh supply of oxygen and the waste products, such as, carbon dioxide must

1. SS., V. 19 (comm).

2. Human Anatomy, p. 1016.

also be thrown out of the body.”¹ The first process by which one breathes in air is called inspiration, i. e. the Jaina ‘apāna’, and the second one by which the impure air inside the lungs is thrown out is called expiration which corresponds to the Jaina ‘prāṇa’. This combined process of inhaling and exhaling air is called respiration, i. e. the Jaina ‘apāna and prāṇa’. The absorption of oxygen by the red corpuscles of the blood and the removal of waste products, such as, carbon dioxide and water, take place in the lungs by this process of respiration.

1. Human Anatomy, p. 1016.

SECOND SECTION

MANIFESTATIONS AND MODIFICATIONS OF MATTER

Manifestations of Matter take the forms of śabda (sound), bandha (combination), sauksmya (fineness), sthaulya (grossness), saṁsthāna (shape or figure), bheda (division), tamas (darkness), chāyā (shadow), ātapa (sun-shine, heat) and udyota (moonlight, cool light).¹

Śabda (Sound)—The cause of śabda (sound)—natural or artificial, has been pointed out to be the striking of molecules (skandhas) against one another, i. e. “sound is generated by molecules when they strike one another, which may be natural or artificial (hence sound may be indirectly associated with atoms also).”²

According to the Sāṁkhya Philosophy³, śabda (sound) is tanmātra (infra-atomic or potential energy) which generates ākāśa (ether), because of being a radicle or centre encircled by masses (Bhūtādi), while the Vaibhāṣika school⁴ of the Buddhists maintains that śabda (sound) as an object of the sense of hearing is one of the fifteen kinds of Rūpa (Matter). The Nyāya-

1. Śabdabandhasauksmyasthaulyaśaṁsthānabhedatamaśchāyā-
ātāpodyotavantaśca, TS., V. 24; Saddāndhayāra ujjoo,
pahā chāyā ātayo i vā, Utta., 28. 12;
Saddo khamdho suhamo thūlo saṁsthāna bhedatamachāyā.
Ujjodādavasahiya puggaladavvassa pajjāyā, DS., 16.
2. Saddo khamdhappabbhavo khamdho
paramāṇusāṁgasāṁghādo
Puttesu tesu jāyadi saddo uppādayo niyado, PS., 86.
3. The Positive Sciences of the Ancient Hindus, p. 26;
Śadviśeṣāḥ tadyathā śabdatanmātram etc., Vyāsabhāṣya,
Sūtra 19, pāda II;
Ahaṅkārād-śabdatanmātram...etc., Pravacanabhāṣya,
Ch. I, Sū. 62.
4. Śabdaśācānye nava dvidhā, Abh. K. I. 34.

Vaiśeṣika conceived śabda (sound) as the quality of ākāśa (space or ether).¹ The Mīmāṃsakas of the Bhāṭṭa school accept śabda (sound) as a substance on the basis of the fact that it is perceived independently and directly and it exists as a self-subsistent real and it does not have the criterion of quality of being perceived invariably as dependent upon a substance substratum.²

The Mīmāṃsaka view of dependence is refuted by the Nyāya-Vaiśeṣika on the ground that the perception of substance is not the essential pre-condition of the perception of quality and the dependence of quality upon the substance is not the exclusive criterion of a quality because every positive real except an eternal substance is dependent upon some substratum for its very existence.³ The Nyāya-Vaiśeṣika maintains that whatever possessed of a universal (jātimat) and is cognizable by some external sense other than the visual sense, is a quality.⁴ Therefore, sound (śabda) is a quality.⁵ It is not an incomposite

1. Śabdalingaviśeṣādviseṣalingabhbhāvaca, VS., II. 2. 30;
Tatrākāśasya gunāḥ śabdasaṃkhyā, PPBhā., p. 23.
2. Viyadguṇitvam śabdasya kecid ūcūrmanīśināḥ, pratyakṣādvirodhaḥ, tad-Bhāṭṭapādairupekṣetāṁ, tatra gunasya sarvatra sāśrayatāpratīyamānatvād iha ca nirāśrayatayai'va
pratītidarśanāt pratyakṣavirodhah ..śabdo dravyam sattve
satyanāśrayatvāt kālavat,
Mānameyodaya of Nārāyaṇa Bhāṭṭa, ed. Trivandrum, 1912,
p. 91.
3. Āśritatvam cā'nyatra nityadravyebhyah, PPBhā., p. 16, cf.
Āśritatvam gunatve hi na prayojakam iṣyate ṣaṇṇāmapi
padārthānām āśritatvasya sambhavāt. Dikkālaparamāṇvādi-
nityadravyātirekināḥ āśritaḥ sad-āpiṣyante padārthāḥ
kaṇabhojinā, NM., Pt. I, p. 210.
4. Studies in Nyāya-Vaiśeṣika Metaphysics, p. 167.
5. Bāhyendriyāgrāhyatvena pratibandhāt, Śabdo guno jāti-
mattve sati asmadādibāhyacākṣusapratyakṣatvāt gandhavat

substance nor a composite one, for the incomposite substance, e. g. atom, or space, or time, or soul, is intangible to the external sense.¹ It is eternal because of being uncaused, but sound is non-eternal, for it is generated under specific conditions.² It is stated to be the product having Ākāśa (ether or space) as its constitutive substratum. But the idea that "substance produced by and inhering in a single substance is inconceivable, since one of the conditions of production, viz. the conjunction of constitutive factors, which is the *asamavāyikāraṇa*, is lacking."³ Hence sound is not a substance. According to the Nyāya-Vaiśeṣika, it is the specific quality of Ākāśa (space or ether).

According to the physical sciences, sound as the manifestation of Matter is conceived as energy of it. This view is identical with the Jaina conception of sound as the manifestation of Pudgala (Matter). It "usually originates in vibrating bodies and that the vibrations are transmitted through the surrounding elastic medium, usually air, as wave motion of the longitudinal type. When the compressional sound waves are passing through air, the amplitude of the vibratory motion of the layers of particles is surprisingly small, being only about 10^{-8} cm for a sound that is barely audible."⁴ This view of the origination of sound as explained in the physical sciences is

yadi tu niravayavadravyam syat bāhyendriyagrāhyam na
syat niravayavadravyasya, NLV., pp. 274-5; SM., pp. 190-1.

1. NLV and NLVK., p. 275.

2. Anityāścāyam kāraṇataḥ, VS., II. ii. 28;

Kāraṇata utpatterdr̥ṣṭatvāditi śeṣaḥ upalabhyate hi bheri-
daṇḍasatmyogādibhyah prādurbhavan śabdah, tathā cot-
pattimattvādanityo ayamiti yadvā kāraṇata iti kāraṇavattva-
hetumupalakṣayati, VSU., Ibid.

3. Ekadravyatvānna dravyam, VS., II. ii. 23; see Studies in
Nyāya-Vaiśeṣika Metaphysics, p. 169.

4. Physics—Principles and Application, 38, 1, p. 560.

similar to the Jaina view of the generation of sound as a result of the striking of molecules against one another.

Kinds of Śabda (Sound) : According to Jaina metaphysics, there are mainly two kinds of sound, viz. bhāṣātmaka (sound incorporated in languages) and abhāṣātmaka (sound which does not find place in languages)¹. The former is sub-divided into two kinds, viz. akṣarātmaka (articulate utterance of speech) and anakṣarātmaka (sound made by creatures or by the Kevalins),² while the latter is also of two kinds, viz. prāyogika (sound produced by human beings with the help of musical instruments, i. e. musical sounds) and vaisrasika (natural sounds, such as, the roaring of the thunder or the rippling of water and the noises in general)³. The prāyogika śabda (artificial or applied sound) is further sub-divided into four kinds, viz. tata (musical sound of table or drum, i. e. a stretched membrane), vitata (musical sound of stringed instruments), ghana (musical sound produced by reed instruments, such as, harmonium, sound from bell) and susira (sound produced from wind instruments, organ pipes or conch)⁴.

According to modern accoustics, sound is divided into two classes, viz. musical sounds and noises. Prāyogika śabdas of Jaina metaphysics, viz. tata, vitata, ghana and susira correspond to the musical sounds of modern physics, while vaisrasika śabdas (natural sounds), such as, roaring of thunder, etc., include the noises—sounds of modern accoustics. Bhāṣātmaka-śabda (sound incorporated in languages) forms a distinct class by itself, but it may be placed under the category of the noises of modern accoustics. The subdivisions of musical sound into the vibrations of membranes, strings, rods and plates and air columns of the physical sciences correspond respectively to the

1. Śabdo dvedhā bhāṣālakṣaṇaviparītatvāt, RV., p. 485.

2. Bhāṣātmaka ubhayathā akṣarīkṛtetaravikalpāt, Ibid., p. 485.

3. Abhāṣātmako dvedhā prayogavirśā nimittatvāt, Ibid., p. 485; Tatra vaisrasiko valāhakādiprabhavaḥ, Ibid.

4. Prayogaścaturdhā tatavitataghanaśusirabhedāt, RV., p. 485..

following kinds of sound of Jaina metaphysics, viz. tata, vitata, ghana and suṣira.

PITCH, INTENSITY, QUALITY AND WAVE OF SOUND AND ITS PROPAGATION

It is explained that Bhāṣā (sound incorporated in languages or speech) is of the beings, it originates from the body, it is of the shape of vajra (thunderbolt) and it reaches the last border of the universe.¹ Bhāṣā having originated from the body, breaks forth by two samayas (instants). There are stated to be mainly two kinds of Bhāṣā viz. paryāptika (developed) and aparyāptika (undeveloped). Paryāptikabhāṣā has been subdivided into two kinds, viz. satyabhāṣā (true language) and mṛṣābhāṣā (wrong or false language). They are again divided and sub-divided into many kinds, such as, janapadasatya, samyagsatya, sthāpanāsatya, nāmasatya, rūpasatya, etc. In reality there are two kinds of Bhāṣā, viz. dravyabhāṣā (physical speech) and bhāvabhāṣā (psychical speech)². Dravyabhāṣā is sub-divided into the following groups, viz. grahaṇam (speech received by the self through transformation), niḥsaraṇa (that which is emitted by the action of lungs, throat, etc.) and parāghāṭabhaṣā (speech sent out by the action of transformation by those emitted physical vocal substances). Beings receive bhāṣā-

1. Bhāṣā nām jīvāiyā sarṣrappabhavā, vajjasamthiyā, logamātappajjavasiyā pannavattā—Pannavanā, Bhāṣāpada, ii, 386.
2. Pannavanā, Bhāṣāpada, 387, 388-90; Nāmāl-nikkhevā, cauro caurehi ettha nāyavvā Davve tivihā gahaṇam tahaya nisirāṇam parāghāyo, BR., 2; Pāhannam dāvassa ya, appāhannam taheva kiryāṇam Bhāvassa ya ālambiya, gahaṇāisu dāvvavavaeso, BR. 11; Uvauṭṭāṇam bhāṣā, nāyavvā ettha bhāvabhāsatti Uvaogo khalu bhāvo, nuvaogo dāvvamitti kaṭṭu, BR. 12.

dravya (vocal substance or speech-substance) from six directions.¹ The nihsaraṇadravya-bhāṣā identical with the voice or speech of the medical science emitted by the beings.

Intensity of Emitted Speech (Bhāṣā) : Bhāṣā breaks forth with gentle efforts, i. e. with low intensity; some speeches are emitted with intense effort and some are unbroken, i. e. continuous. The broken (emitted) speeches go to the last border of the Universe, getting increased and increased infinitefold. That is to say, some healthy speaker emits bhāṣādravya (speech-substances or vocal substances) with intense effort out of liking and they are broken forth into parts by the efforts of receiving and throwing out matters, while some sick person emits gross particles of unbroken (continuous) speech-substance with gentle effort out of disliking. These particles of unbroken speech-substance, getting increased infinitefold on account of fineness and manifoldness and association with other material substances go to the last borders of the Universe in six directions, i. e. spread to the last borders of the Universe.² In other words, a

- I. Goyamā ṭhiyāim gīnhai, no atṭhiyā im gīnhai...davvaō vi
gīnhai khettao vi kālao vi, bhāvao vi gīnhai, PV., Bhāṣā-
pada, 11. 395;

Bhāṣakānām niyamātrasanādyāmavasthānena teṣām saddi-
ggatānām eva pudgalānām grahaṇasāmbhavāt, ālāpakaś-
cātra prajñāpanāyāmevānusandheyāḥ, Bhāṣārahasya, Tīkā,
p. 2.

2. Putṭham sunēi saddam rūvam puna pāsai apuṭṭham tu...
(336) ni. 5, p. 130;

chikkāim ciyām gīnhai saddadavvāim (337) Jaṁ tāim
Bhāṣā samasedhiō saddam Jaṁ sunai mīsayām sunai
Viſedhi puṇa saddam sunai niyamā parāghāe 35, Ni 6
Seḍhi paesapamti vadato savvassa saddisiṁ tāo
jāsu vimuttā dhāvai bhāṣā samayammi padhamammi (352)
Bhāṣāsamasedhiṭhiō tabhāsāmīsiyām sunai saddam
taddavvabhāviyāim anṇaiṁ sunai vidisattho (353)
Anusedhigamaṇāo padīghāyābhāvo animitāo

being emits speech-substances which it receives for speaking as broken and unbroken (*bhinna* and *abhinna*).¹ Those speech-substances, being emitted, touch the last borders of the Universe, getting increased and increased infinitesold. The unbroken speech-substances, having crossed countless points of immersion, breaks forth and having gone to countable *yojanas* die out² in the horizon.

Parāghāta Bhāṣā-dravya : There takes place the force (*vāsanā*) called *parāghāta* (impact or striking=wave) of the *prayoga-vāsanā-yogya-dravyas* (speech-substances pronounced with the efforts of palatals, etc.). That *parāghātabhāṣā* is emitted as being generated by the striking of speech-substances against one another out of straight line (i. e. in a curved line) due to the fineness of emitted speech-substa-

Samayamtarānavatthānāo ya mukkāim na suṇei (354)

Tivihammi sarīrammi Jivapaesā havam̄ti Jivassa

Jehi ugeṇhai gahaṇām to bhāṣai bhāṣao bhāṣam, ni 8

Oraliyaveuvviya ābhārao geṇhai muyai bhāṣam saccam
saccāmosām ca asaccāmosām ca (375), ni 9

Anahigayā jā tisu vi saddo ciya kevalo accasusā
eyā sabheyalakkhaṇa sodāharanā jahā sutte (377)

V. Bhāṣya.

Bhinnāi koi nisirai, tīvrapayatto paro abhiṇṇāim

Bhinnāi jaṁti logam̄ anaṁtaguṇavuddhijuttāim, Bhāṣāra-
hasya, 5;

Goyamā ! bhinnāim pi nisirai abhinnāim pi nisirai jāim
bhinnāim nisirai tāim anaṁtaguṇapārivuḍḍhie parivuḍḍha-
mānāim loyam̄tam, phusam̄ti, Pañṇavānā, Bhāṣāpada,
11. 398.

1. PV., Bhāṣāpada, 11. 398.
2. Bhijjaṁti abhinnāim, avagāhaṇavaggaṇā asaṁkhijā gaṁtuṁ
vā joyaṇāim, saṁkhijjāim vitijjaṁti”, Bhāṣārahasya, 6;
Jāim abhinnāim nisirai tāim asaṁkhijjāo ogāhaṇavaggaṇāo
gaṁtā bhedamāvajjaṁti saṁkhejjāim joyaṇāim viddham-
samāvajjaṁti, Pañṇavāna, Bhāṣāpada, 11. 398.

nces from the going in a straight line (annśreni-avagāhanā). Paraghataline (sama bhāṣā-kadigapekṣa-pradhvarā śreni). So it is stated in the Niruykti that parāghātabhāṣā goes in a curved line.¹

In regard to the propagation of sound the early Nyāya-Vaiśeṣika philosophers maintain that the first sound, generated by the impact of vibrating molecules of sonorous bodies against contiguous molecules of air in the substrate Ākāṣa² generates sound in the contiguous Ākāṣa and the second sound a third sound and so on, just as waves produced in water or ocean, until the last sound causes a vibration in the ear-drum (karnāśaṣkuli). This propagation of sound is effected by the air-wave as its carrier. Ākāṣa is immobile, but the air-wave is not transmitted without the inter-connecting of air-molecules by Ākāṣa. Udyotakara³ holds the view that the first sound

1. Bhāṣā samasedhio saddaṁ jam suṇai mīṣayatī suṇai
Visedhi puna saddaṁ suṇei niyamā parāghāe,
Bhāṣārahasya, 10.
2. Śabdo ambaraguṇah samyogavibhāgaḥ śabdajah...sthāna-vāyusamyogapekṣamānāt sthānākāṣasamyogāt varṇotpattiḥ avaraṇakṣaṇo api bherīdanḍasamyogapekṣat bheryākāṣasamyogāt utpadyate, PPBho., p. 156;
Veṇu parvavibhāgāt veṇvākālavibhāgācca śabdācca samyogavibhāganiśpannāt vīcasantānavat śabdasantāna ityekāṁ santānena śrotapradeśamāgatasya grahaṇam, Ibid., Vīcyantaramupajāyate tato apyanyat tatopyanyadityaneoā kramena vīcasantāno bhavati, nanveṣa kalpanā kutaḥ siddhyatītyāḥ, etc. NK. p. 157.
3. Parīṣeṣat tu santānasiddhiḥ/tatrādyah śabdaḥ samyoga-vibhāgahetukah/tasmāt śabdāntarāni kadambagolakānyā-yena sarvadikkāni tebhyaḥ pratyekamekaikah śabdaḥ mandataratamādinyāyenāśraya pratibandhamanuvidhīyamānah prādūrasti, tato antyasyātīmāndyāt śabdāntarotattī śaktivighāto yena pratibandhāt bhavati,
Udyotakara, 11.2.14, NV., p. 286.

produces indefinite number of sounds in all directions, not one sound in a circle; each of them generates again another one and so on, in such a way that sound expands by successive concentric spherical layers, just as kadambakoraka (bud of the Nancha Kadamba) expands by successive concentric spherical layers of filaments, shooting forth from one another. Of these two hypotheses the first air wave implied in the transmission of sound is of the transverses waves, while the second is of longitudinal waves. In the orthodox Mīmāṃsaka view of Śabaravāmin the air-wave forming physical sound signifies a series of conjunctions and disjunctions of air-particles with rarefaction and condensation and suggests longitudinal waves.¹ Sound dies out at last with the growing of the momentum of the impact of series feebler and feebler in the course of transmission of sound through the air-particles. Another view is that the propagation of sound is not effected from molecule to molecule, but it spreads in ever expanding circles, just as evidenced in water-waves, perhaps in spherical layers by the compression of masses of air, the waves of which are very fast.² There is a striking similarity between the Jaina view and the Nyāya-Vaiśeṣika theory on the wave of sound and its propagation. Both of them agree on the point that sound becomes refracted as well as diffracted according to the cause of its generation. It increases infinitefold on account of fineness and manifoldness and association with other substances, like air, etc., and expands in all directions and go to the last borders of the Universe. The unbroken (continuous) sound attains division and dies out at last; after crossing countable distance with the growing of the momentum of the impact of series

1. Vīcitarānganyāyena tadutyabhittisu kīrtita kadambakorakanāyādutpatti kasyacinmate, Bhāṣāpariccheda, Sl. 165, Viśvanātha.
2. Yathā, ‘ādyāśabdena kadambagolakayad daśadiśi daśāśabdā ārambhante taiśca daśāśabda-santānā iti, Tattvacintāmaṇi, Gaṇeśa.

feeble and feeble. But there is the difference between the two views on the fundamental point that sound is accepted as the quality of Ākāśa in the Nyāya-Vaiśeṣika Philosophy, while it is conceived as the manifestation of Matter in Jaina metaphysics.

The Jaina theory of wave of sound and its propagation is well supported by modern physics. It is explained that "sound waves, of course, exhibit the properties of reflection, refraction, and diffraction characteristic of all forms of wave motion. Such behaviour of sound waves may be rendered visible by the method of spark photography. The waves passing before the photographic plate are illuminated for a brief interval by a timed electric spark. The slight increase in density in the condensation in the wave front causes some refraction of the light and thus produces a shadow in the photograph."¹

"If a train of waves is filling a medium, a surface connecting at a given instant all particles which are in the same phase of vibration constitutes a wave front. In the case of sound waves in air, the vibrating source being quite small, such a surface will be spherical; and if the distance from the source is large, a small portion of this spherical wave front may be considered as a plane wave. If the medium is homogeneous and isotropic, the direction of propagation is always at right angles to the wave front."²

"The behaviour of the wave fronts as a uniform medium, bends around obstacles (diffraction), rebounds from a surface (reflection), or changes direction when entering a new medium (refraction) may be predicted by using a simple, method first proposed by Huygens (1629-1695), a contemporary of Newton."³ According to his principles, "every point on a wave

1. Physics—Principles and Applications Margenau, Watson and Montgomery, 38, 1, p. 560.

2. Physics—Principles and Application, p. 552.

3. Ibid.

front may be considered to be a new source of disturbance from which spherical wavelets issue.”¹ Here is the point which is explained by Jaina philosophy in this way that parāghāta bhāṣādravyas (generated sound-particles or waves by striking) increase infinitefold and expand and go in a straight line, a curved line and a parallel line or in mixed line to all directions.

BANDHA (BINDING)

Bandha is the binding of various forms of substance by the force of which they draw together and stick. It is of two kinds, viz. vairasika (natural) and prāyogika (mechanical or that brought about by human efforts). The first one is caused by the mixture of smooth and rough particles of matter (i. e. positive and negative electric charges) in lightning, meteoric showers, rainfall, fire, rainbow, etc. The second one is two-fold combination of non-living things and combination of living and non-living substances, as for instance, the combination of non-living things, resin, wood and so on. Jīvajīvavīśayabandha (combination of living and non-living objects) may result from (i) karma producing eight kinds of bondage corresponding to eight kinds of karma, viz. (i) jñānāvaraṇiyakarma (knowledge-onscuring karma up to antarāyakarma (energy-hindering karma) and (ii) no-karma (which aids the fruition of karmas), which is classified into ālāpana (fastening of a rope,

1. Physics—Principles and Applications, p. 552.

Reflection of Waves; “The law of reflection for a wave front incident upon a smooth obstructing surface may be obtained by application of Huygens’ principle (Physics, p. 553) Refraction of Waves; “When a wave front passes obliquely from one medium into another in which it travels with a different velocity, its direction will change. This is the phenomena of refraction.” Ibid., p. 556.

or chain to a chariot), ālepana (painting the wall, etc.) saṁśleṣa (joining of pieces of wood together by a carpenter), śarīra-bandha (the binding of limbs in a body) and śarīri-bandha (the binding of different bodies).¹

Vaisrasikabandha (natural binding or combination) is either anādi (beginningless), i.e. the binding combination of the whole mass or Dharma (principle of motion), Adharma (principle of Rest) and Ākāśa (Space), or ādimat (that which has a beginning because of its origination from a definite cause), e. g. the combination of different colours, in a rainbow, production of lightning, the shooting stars, and the formation of clouds. The whole of half of a quarter of each Dharma, Adharma and Ākāśa (Principles of Motion, Rest and Space) may be said to contain different parts which are attached to another. Thus there are nine kinds of binding or combination which are eternal.² Besides, there is miśrabandha (prayoga-viśrasā), e.g. bandha (binding) of pillar, jar, etc., caused by human effort and non-living material substances.³

1. Goyamā ! duvihe baṁdhe paṇṇatte, tamjahā—paogabāṁdhe ya viśasā baṁdhe ya ; viśasābaṁdhe . duvihe paṇṇatte, tamjahāsāya-viśasābaṁdhe ya anāya-viśasābaṁdhe ya, etc., BhS., 8.9. 344-347;

Khamdho' api dvedhā viśrasāprayogabhedāt, adya dvedhā ādimadanādivikalpāt, viśrasā vidhiviparyaye nipāṭah prayogah purusakāyavāñmanahsaṁyogalakṣaṇah prāyogikah sa dvedhā ajīvaviṣayo jīvājīvaviṣayaśceti jīvājīvaviṣayaḥ karma no-karṇabandhah karmabandho jñānāvaraṇādiraṣṭā, no-karmabandhah pañcavidhah—Ālapanālepanasaṁśleṣa-śarīraśarīr bheḍāt", RV., V. 24, 6.7.8.9; p. 487.

2. Kṛtsno dharmāstikāyah tadardham deśah ardhārdham pradeśah evam adharmākāśayoh, dharmādharmākāśanāmekaśah traividhyānnavavidhah, RV., V. 24. 7, p. 487
3. Prayogavisrasābhyaṁ jīvaprayogasahacāritācetanadravya-pariṇatilakṣaṇah stambhakumbhādirmiśrah, TS., p. 360.

OTHER MANIFESTATIONS OF MATERIAL SUBSTANCE

Saukṣmya (Fineness) : Saukṣmya is the subtle manifestation of the material substances. It is of two kinds, viz. antya (absolute or extreme) and apeksika (relative). Antya (extreme fineness) is found in indivisible ultimate atoms. Instances of relative fineness are the wood apple, myrobalan, plum, etc.¹

Sthaulya (Grossness) : Sthaulya is the gross manifestation of the material substances. It is also of two kinds, viz. antya (absolute or extreme) and apeksika (relative). The example of extreme grossness is the biggest molecule of matters pervading the entire Universe, while the instances of relative grossness are the plum, myrobalan, wood apple, palmyra fruit, etc.²

Saṁsthāna (Shape) : Saṁsthāna is the shape of the material substance. It is of two kinds, viz. ittham (that which can be defined) and anittham (that which cannot be defined). The regular geometrical shapes or figures, such as, circle, triangle, rectangle, square, globe, etc., are the instances of the first variety. The clouds, etc., may be of various irregular shapes, which cannot be exactly described. They are the instances of the second variety.³

Bheda (Division) : Bheda is the division of the material substances. It is of six kinds, viz. utkara (e. g. sawing a piece of wood), curṇa (e. g. grinding barley and wheat into flour), khanda (e. g. breaking up of pitcher into different potsherds), curṇika (e. g. separating the chaff from rice, pulses, etc.) pratara (e. g. dividing mica into many layers or slices) and

1. Tatrāntyam paramāṇūnām āpeksikam bilvāmalakabadarādinām, SS., 5. 24 (Comm). See RV., 5.24; 10; p. 488.
2. Sthaulyamapi dividham antyamāpeksikam ceti tatrāntyam jagadvyāpiṇī mahāskandhe āpeksikam badarāmalakabilvatālādiṣu, Ibid., See, RV., p. 488.
3. BhS., 25. 3. 723; SS., p. 296.

anucatana (e. g. causing spark of fire to fly out from a glowing ball of iron, etc.)¹

Tamas (Darkness) : As pointed out before, Tamas (darkness) is conceived as material in Jaina metaphysics. Besides, the Jaina view regarding it has been supported by the Vedic and Buddhist works. In the Jaina Āgama Bhagavati Vyākhyā-prajñapti it is stated that "Day is bright and night is dark (Diya ujjoe rātīm aṁdhayāre), because in the day time there is auspicious matter, the transformation of which is auspicious, while at the night time there takes place the transformation of inauspicious matter.² Here the purport of this statement is this that both light and darkness are material. Ācārya Pūjyapāda has defined Tamas as the antithesis of light and the cause of obstruction to vision.³ It is not the negation of light. In the physical sciences also it has been demonstrated that there exist infra-red rays in complete darkness and "they can be perceived by the eyes of a special photographic plate." "In the absence of these dark rays it is not possible to have photography in pitch darkness."⁴

Chāyā (Shadow) : Chāyā (shadow) results from the obstruction of light by an object. The Vaibhāṣika school also accepts chāyā (shadow) as Rūpa (matter) having colour and shape. It is of two kinds, viz. images as seen in a mirror and univerted images like shadows. In the first instance of these two the left side becomes right and the right side becomes left.⁵ The produc-

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1. Paṁjavihe bhee paṇṇitte tamjahā khaṁdabhee payarābhee cūṇiyābhee aputadiyābhee, ukkariyābhee, etc., PV., 399-400; SS., p. 296.
 2. Diyā subhā poggalā subhe poggalapariṇāme rātīm asubhā poggalā asubhe poggalapariṇāme, BhS., 5. 9. 224.
 3. Tamo dṛṣṭipratibandhakaraṇam prakāśavirodhī, SS. 5.24 (Comm).
 4. Cosmology Old and New, p. 195.
 5. Chāyā prakāśavarāṇanimittā sā dvedhā, varṇadivikāra-parinatā pratibimbamātrātmikā ceti, SS. 5. 24 (Comm).

tion of shadow is explained by the physicists in the following manner. "An opaque obstacle in the path of the rays of light casts a shadow because the rays are obstructed and are unable to enter casts a shadow because the rays are obstructed and are unable to enter the region of the shadow. The images formed by lenses and mirrors are of two kinds called virtual and real. The example of a virtual image is the image seen in a looking glass, whereas the example of the latter is the images in a cinema screen. In the case of virtual image the rays appear to come from the image, whereas in the case of a real image, the rays do actually come from it, i. e. energy manifests itself in the form of shadows and images, virtual and real."¹ The Jaina conception of chāyā (shadow) differs from that of modern physics, for the Jainas accept chāyā as material on the ground that it is apprehensible to the sense of sight with its colour and shape, while modern physics holds the view that an opaque obstacle in the path of the rays of light casts a shadow, as the rays are obstructed on its way to the entry into the region of the shadow.

Ātapa (warm light or heat, sunshine) and Udyota (cool light, moonlight etc.)

Ātapa is heat and light combined emanating from the sun, fire, etc.² while udyota is light emitted by the moon, the firefly (glow worm), jewels, etc.³ It is a well known fact in the Jaina system of thought that the sunrays and moon-light are natural. They make space bright, cause to shine and make it hot and illustrious by their respective lights in six directions.⁴ Some hold the view that the sunrays are sometimes resisted by

1. Cosmology Old and New, pp. 88-89.

2. Ātapa ādityādinimitta usñaprakāśalakṣaṇah, SS., p. 296.

3. Udyotāścandra�āṇikhadyotadiprabhavaḥ prakāśah, SS p. 296.

4. BhS., 8. 8. 344; Sūriyapaññatti, 3. 24, 25, 26, 28; Canda paññatti 28.

matters which come into contact with it.¹ This division of prakāśa (light energy) into ātapa (warm light) and Udyota (cool light) is made on a scientific basis. The first one is preponderant in heat-rays and the second one in light-rays. According to modern physics, "heat is a form of energy and may be measured in energy units."² It may correspond to ātapa of Jaina Metaphysics, but ātapa denotes both heat and warm light.

From earlier recorded times up through the period of Newton's and Huygen's great discoverites, i. e. to about 1700, practically all thinking about the physical world was confined to the fields of mechanics and light. Prior to 1678, when Huygens studied the possibilities of a wave theory, it was commonly believed that light consists of corpuscles shooting out in straight lines from a luminous source. The ancient Greek philosophers knew such facts as the regular reflections of light at a smooth surface where the angle of reflection equals the angle of incidence; they knew qualitatively about the refraction of light at a surface separating two transparent media, such as air and water, and the apparent straight-line, or rectilinear propagation of light. All these facts could be explained quite well by a corpuscular theory³ of Newton that light travels in a straight line. The value of the Jaina theory of ātapa and udyota lies in the fact that it touches upon both heat and light theories in a nascent form.

MODIFICATION OF MATTER

Dravya (Substance) is one entity, while Dravya-Paryāya (modification of substance) is of two kinds, viz. jīvadravyaparyāya (modification of living substance) and ajīvadravyaparyāya (modification of non-living substance). There exist

1. Ta je ḥam puggalā sūriyassa lessam phusamti te ḥam puggalā sūriyassa lessam padinamti, Sūryaprajñapti, 3.26
2. Physics, p. 248.
3. Ibid., p. 588.

guṇa (quality) and paryāya (mode or modification) in Dravya (Substance); the Jaina paryāya belonging to both Dravya (substance) and guṇa compares well with the Prakṛti-parināma (transformation or modification of the Primordial Matter) of the Sāṃkhya philosophy, though there is some difference of views between them.

According to Jaina Philosophy, there is paryāya of Jīvadravyas and ajīvadravyas (living and non-living substance), while the Sāṃkhya maintains that there takes place the transformation of Acetana Prakṛti (Non-Sentient Principle). The difference between Cetana and Acetana, i. e. jīvadravya and ajīvadravya is marked by sentiency and non-sentiency respectively as existing in them. In Jaina metaphysics parināmavāda (the theory of evolution or transformation) also is advocated; dravyapariṇāma (transformation of substance) and guṇapariṇāma (transformation of quality) occur as a result of natural conditions (vaishasika) or due to the applied or mechanical process (prāyogika). Hence paryāya is again of two kinds, viz. dravyaparyāya (modification of substance) and guṇaparyāya (modification of quality). Both dravyaparyāya and guṇaparyāya take place in Matter. There is manifested the combined modification of Soul and Matter in the body of a being. The figure (or structure) of a being is formed by the union of Soul and body. When karmaraja (karmic-dust or karmic particle) is united with leśya-parināma (transformation of psychic condition) of Soul, there takes place avagāhanā (immersion) as a result of the combination of body and Soul. There falls an impression from Matter on Soul. When karmic matter comes into contact with soul, there occurs ajīvapariṇāma (transformation of non-living substances). Jīvaparyāya (modification of Soul) cannot happen without its gatipariṇāma (change of birth). The Buddhist kṣaṇa (moment) corresponds to the Jaina paryāya for kṣaṇas (moments) like rūpa (colour), rasa (taste), gandha (smell), etc., of the Buddhist philosophy are equivalent to paryāyas of Jaina metaphysics. Tadetadrūpa-kṣaṇām of the Buddhists, Tanmātras of the Sāṃkhya and Viśeṣa (particularity) of the Yoga reflect the Jaina

Paryāyavāda. It was the question to Vasubandhu whether the present dravya-paryāya was, is and will be respectively in the past, at present and in future.¹ Bergson maintains that "the truth is that we change without ceasing, and that the state itself is nothing but change".

The Jaina Paryāyavāda is again of two kinds, pūrvaparyāya (prior or past modification or mode) and paraparyāya (posterior or future modification or mode). It appears that paryāya-paramparā (tradition of mode) has been changing in the Indian Philosophy, for the Jainas accept two kinds of paryāya, viz. paryāya-sadṛśa (similar or general modification) and paryāya-visadṛśa (dissimilar or particular modification), while the Buddhists maintain paryāya-visadṛśa (dissimilar or particular modification) in santānas (issues or series) or flux of the Saṃtrāntikas. The Sāṃkhya admits sadṛśa pariṇāma (similar or general transformation) in the Guṇa-series and visadṛśa-pariṇāma (dissimilar or particular transformation) in its creative evolution.

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1. There are dravyapravāha and paryāyapravāha on the screen of time (kāla pāṭa)

The Buddhists advocate paryāyapravāha (series of modes or issues) in the form of rūpakṣaṇa, etc. According to the Sāṃkhya there takes place guṇaparyāya (pariṇāma) and dravyaparyāya (pariṇāma) in Prakṛti. There emerges Buddhi (intellect), Ahamkāra (ego), manas (mind) etc. from the modification of Prakṛti out of guṇas-sattva, etc.

The emergence of tanmātra (infra-atomic potential) from Bhūtādi (original mass), paramāṇu (atom), gross elements of Matter is Dravyaparyāya. In Yogasūtra Prakṛti is accepted as sāmānya (general), while tanmātra, etc. are admitted as viśeṣa (particular), for there emerges ākāśa (ether), etc. from tanmātra (infra-atomic potential). In the Sāṃkhya-yoga Prakṛti is conceived as one unmanifest or intangible substance, while the intangible infinite atoms are conceived in Jaina Philosophy as nānāprakṛtis (many prakṛtis).

AJIVAPARYĀYA (MODIFICATION OF NON-LIVING SUBSTANCE)

As the topic is conceived here with the modification of Matter, the study of it will be confined to an analysis of ajivaparyāya (modification of non-living substance) by leaving out the treatment of jīvaparyāya (modification of living substance). Ajivaparyāya is of two kinds, viz. rūpt-ajīva-paryāya (modification of corporeal material non-living substance) and arūpt-ajīva-paryāya (modification of non-corporeal non-living substance).¹ Arūpt-ajīva-paryāya is stated to be of ten kinds² viz. Dharmāstikāya (Principle of Motion), Dharmāstikāyadeśa, (part of Dharmāstikāya), Dharmāstikāyapradeśa (smallest unit of Dharmāstikāya), Adharmāstikāya, (Principle of Rest)-Adharmāstikāyadeśa (part of Adharmāstikāya), Adharmāstikāyapradeśa (smallest unit of Adharmāstikāya), Ākāśastikāya (Space), Ākāśastikāyadeśa (part of Space) and Ākāśastikāyapradeśa (point of space) and Addhāsamaya (Time).³ There are stated to be four kinds of rūpt-ajīva-paryāya, viz. skandhas (molecules or aggregates), skandhadeśa (part of molecule or aggregate), skandhapradeśa (smallest unit of aggregate)⁴ and paramāṇus (ultimate atoms).⁵

Ultimate atoms and their aggregates are infinite in number.⁶ There are infinite modifications of ultimate atoms, for one ultimate atom is equal to another one from the points of view

1. Duvihā ajīvapajjavā, tamjhā—rūpt-ajīvapajjavā ya arūpt-ajīva-pajjavā ya—Paññavanā, 266.
2. Ibid. 267.
3. Paññavanā, 267 (Suttagama)
4. Skandha, skandhadeśa and skandhapradeśa form one joint family in which ultimate atom also is united, though it is a unit (pradeśa), i. e. pradeśa is conceived by intellect, while paramāṇu (ultimate atom) is separate or discrete from that family.
5. When an ultimate atom exists separately.
6. Paññavanā, 288.

of substance, mode and immersion, but it may be less or equal or more from the point of view of duration (sthiti). If it is less, it is less by innumerableth part (pradeśa) or numberableth part or numerablefold or innumerablefold. If more, it is more by innumerableth part or numerableth part or numerablefold or innumerablefold.¹

With regard to the modification of black colour, it (ultimate atom) is sometimes less, sometimes equal and sometimes more. If less, it is less by infiniteth part (unit) or innumerableth part or numberableth part or numerablefold or innumerablefold or infinitefold. In the case of modifications of the remaining colours, smell, taste and touch six sections of the above account of an ultimate atom should be known.² Of the eight touches there are stated to be six sections of the said account of an ultimate atom with regard to the four touches, cold-warm, and cohesive-dry. For this reason, it is said that there are infinite modifications of ultimate atoms.

There are stated to be infinite modifications of the dvipradeśika skandha (dyad), for one dvipradeśika skandha is equal to another dvipradeśika skandha from the substantial and modal stand-points, but it is sometimes less, sometimes equal and sometimes more with regard to immersion (avagāhanā). If less, it is less by one unit (pradeśa); if more, it is more by one unit (paesa-sama-bbhahie). In regard to duration (sthiti) there are stated to be four sections as mentioned above in the case of ultimate atom, while six sections of the account of dvipradeśika skandha should be known with regard to colours, etc. and the aforesaid four kinds of touch. In this way a detailed account of the modifications of paramāṇus (ultimate atoms), dvipradeśikaskandhas up to anantapradeśikaskandhas have been given in the Prajñāpanā Sūtra from the points of view of substance, mode, immersion, duration, colour.,

1. Paññavānā, 288.

2. Evaṁ avasesavaññagāndharasaphāsapajjavehim
chaṭṭhānavadi, PV., 268.

smell, taste and touch,¹ having kept in view minimum, maximum and neither minimum nor maximum (medium) numbers of them in the light of substance and quality.²

Besides, there are stated to be infinite modifications of Jaghanya gunakālaka-paramāṇu (ultimate atom having the lowest degree of the quality of blackness). A paramāṇu having such quality is equal to another jaghanyagunakālakaparamāṇu from the points of view of substance, mode, immersion and four sections with regard to duration; it is equal to the latter with regard to the modes of black colour; six sections should be known in the case of smell, taste, and two touches. Thus the accounts of the utkṛṣṭagunakālakaparamāṇu (ultimate atom having the highest degree of quality of blackness) and ajaghanya-anutkṛṣṭagunakālaka-paramāṇu (ultimate atom having neither the lowest nor the highest degree of quality of blackness) should be understood; only the difference is that in their respective categories six sections should be known. In this way infinite modes of jaghanyagunakālaka dvipradeśikaskandha (molecule having two units of matter) upto ananta-pradeśikaskandhas (molecules having infinite units of matter) are explained from various points of view in the case of the remaining colours, taste, smell and touch.

The accounts of these modifications of Matter from the stand-points of substance, mode, immersion, duration and properties—colour, taste, smell and touch, appear to be thought-provoking when compared to the modes or relations of Matter as dealt with in the physical sciences. In both physics and chemistry Matter has been conceived to the infinite in number from the aspects of substances, quality and relations (or modes).

1. See PV., 269-274.

2. Ibid., 275-279.

SEVENTH CHAPTER
CLASSIFICATION OF MATTER

In Jaina Philosophy Matter is classified into one, two, three, four, six, twenty-three, five hundred thirty and infinite groups from the points of view of (1) dravya (substance), kṣetra, (field), kāla (time) and bhāva (condition), (2) atomic and molecular forms of existence, (3) apprehensibility and inapprehensibility, receivability and non-receivability, etc., (4) transformation, (5) parts of molecule, (6) grossness and fineness of matter, (7) vargaṇā (the group having the same numerical value), (8) prominence of particular quality of matter, (9) jāti (category), part of quality (guṇāṁśa) and mode or modification of matter, respectively.

Matter is infinite in number from the point of view of dravya (substance).¹ All material substances—sapradeśa and apradeśa (having parts and partless) are infinite with regard to dravya, kṣetra, kāla and bhāva.² The classification of infinite forms of matter is also made from this substantial point of view.³ These infinite forms of matter are of infinite kinds with regard to jāti (category)⁴ and bhāva (condition).⁵ Molecules and ultimate atoms are stated to be of infinite kinds from

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1. Davvao ḥam poggalatthikāe aṇamītāim davvāim., Bhs.. 2. 10. 117.
 2. Davvādesenavi me aijo savve poggalā sapaesā vi appaesā vi aṇamītā, khettādesenavi evam̄ ceva, kālādesenavi, bhāvādesenavi evam̄ ceva, Ibid., 5. 8. 220.
 3. Anantā bhedāpi pudgalāḥ, RV., V. 25. 3.
 4. Jātyādhārānāntabhedasamśūcanārtham bahuvacanam̄, aṇavāḥ skandhāśca kriyate,, RV., V. 25.
 5. Paramāṇapoggalā ..no saṁkhejja no asaṁkhejjā aṇamītā, evam̄ jāva aṇamītapaesiyaṁ khaṁdhā ..jāva aṇamītaguṇaluk-khātti, Bhs., 25. 4. 740.

the modal stand-point, because the modes of matter are infinite.¹

One class of Matter

All forms of matter are individually ultimate atoms, i. e. the finest forms of matter. Matters or forms of matter existing in uncombined or discrete state are ultimate atoms,² hence there is one class of Matter, i. e. paramāṇu (ultimate atom), with regard to the nature of ultimate atom. The ultimate division of Matter is only one ultimate atom. All forms of matter are ultimate atoms from the point of view of Niścaya Naya (real point of view). Therefore, an ultimate atom is one from the general stand-point³ and the class of ultimate atoms is one.⁴ It is stated that there is one—one class of Matter with regard to dravya, kṣetra, kāla and bhāva, viz. one class of ultimate atoms upto one class of molecules having infinite units (pradeśas) one class of matters immersed in countless space—points, one class of matters having the duration of one samaya (instant) upto one class of matters having the duration of countless samayas (instants) and one class of matters having onefold black colour upto one class of matters having innumerablefold black colour and one class of matters having infinitesold black colour, thus with regard to the remaining colours, smells, tastes and

1. Khaṁdhā khaṁdhadesā, khaṁdhapaesā paramāṇupoggalā, cauvvihā ajīvapajjavā no saṁkhejjā, no asaṁkhejjā aṇamītā, PV., 5. 268; see also BhS., 25. 5. 740;

Aṇamītā paramāṇupuggalā, aṇamītā dupaesiyā khaṁdhā jāva aṇamītā dasapaesiyā khaṁdhā, aṇamītā saṁkhejjapaesiyā khaṁdhā, aṇamītā asaṁkhejjapaesiyā khaṁdhā, aṇamītā, aṇamītapaesiyā khaṁdhā, PV., 5. 268

2. Parasprenāsamayuktā paramāṇavah TS., Bhā Tī, V. 25, p. 366 2;

Tatrāṇavo abhandhāḥ skandhāstu baddhā eveti, TS., p. 366.

3. Ege paramāṇu, Sthānā., 1, 45.

4. Egā paramāṇupoggalāṇāṁ vagganā, Ibid., 1.57.

touches upto one class of matters having infinitefold dry touch, one class of molecules (skandhas) having minimum number of units, one class of molecules having maximum number of units, one class of molecules having neither minimum nor maximum number of units, thus the classes of molecules having minimum, maximum and neither minimum nor maximum immersion, minimum, maximum and neither minimum nor maximum duration, minimum black colour, maximum black colour and neither minimum nor maximum black colour; thus with regard to the remaining colours, smells, taste and touches upto one class of molecules having neither minimum nor maximum dry touch.¹

In the Nyāya-Vaiśeṣika Philosophy, paramāṇus (ultimate atoms) from one class as the ultimate cause of the Universe, though there are stated to be different kinds of paramāṇus e. g. earth-atom, etc. According to the Sāṃkhya-Yoga, Prakṛti represents one class of matters as the Primordial Matter like the Jaina Paramāṇus, while in the physical sciences only energy of matter exists as one class in the form of its manifestation in the Universe.

Two classes of Matter

In Jaina Philosophy the entire mass of Matter (Pudgala) has been classified into two forms, viz. paramāṇu (ultimate atom) and skandha (molecule or aggregate of ultimate atoms). So Matter exists in the forms of paramāṇu and skandha (ultimate atom and molecule). The material substance which is cause-like is called paramāṇupudgala (ultimate material substance); it is eternal. The apprehension of this atomic matter cannot be made by the senses; it is the material substance which is to be apprehended by the knowledge revealed in the Āgama or by inference. The existence of it has been inferred by the mark of its effect. Those material effects which are come across are

1. Egā paramāṇupoggalāṇāṁ vaggaṇā ajahannukkosaguna-lukkhāṇāṁ poggalāṇāṁ vaggaṇā—Sthānā, I. 74, p. 185.

having a cause. In this way that which will be intangible last effect should also have the cause, i. e. it is paramāṇudravya (atomic substance); it is called an ultimate cause because of there being no other material substance as its cause. There is neither further division of an ultimate atom nor can there take place any division of it. For this reason it is its own beginning, its own middle and its own end in itself. Atomic material substance is infinite and discrete (unaggregated) in its own condition. So there are stated to be two kinds of ultimate atom, viz. kāraṇa-paramāṇu (cause-ultimate atom) and kārya-paramāṇu (effect-ultimate atom).¹

Akalaṇka deals with the extreme point of view of the Vaiśeṣikas with regard to the mark (liṅga) of paramāṇu in the following manner : "The last atom is only cause, subtle and eternal. There is one taste, one smell, one colour and two unopposing touches in it and it is inferable by the mark of its effect."² But it is not logical. The argument "paramāṇu is only cause" is not proper because it is also an effect on account of its production by the division of skandhas (molecules). Its kāryatva (effectness) is negated by the statement "kāraṇameva". When "kāraṇamapi" is stated, then kāryatva remains unnegated. In an ultimate atom the qualities like cohesiveness, etc., are born and destroyed. Therefore, it cannot be called permanent by all means because of being somehow non-permanent (non-eternal). "The ultimate atom exists as aṇu (small) from the beginningless time, and it is the cause of binary compound, etc., from this point of view it is called "kāraṇameva". This solution of the said problem is not correct, for, if the ultimate atom does not give up its aṇutva (atomicity or smallness), there does not take place any production of effect. If there is the division of aṇutva (atomicity) then

3. Dhātucatuṣkasya punah yo hetuh kāraṇamiti samjñeyah
Skandhānāmavasāno jñātavyah kārya-paramāṇuh,
Niyamasāra, 25 (Skt. Chāyā).

2. VS., 4. 1. 2.

it itself will be an effect. It cannot be called cause (*kāraṇa*) also till an effect is produced by the division of such *anutva* (atomicity). In the absence (or non-existence) of the son, the father is not appellated as such. There cannot fall the shadow, etc., of the beginningless ultimate atom, for shadow, etc., take place in the case of skandha. Therefore an ultimate atom cannot be the cause from the point of view of an effect like shadow, etc. They are perceptible to the eyes. Hence they cannot be the effects of ultimate atoms. An effect of ultimate atoms will be imperceptible to the sense of sight : nevertheless, there is no *anu* (atom) existing in the condition of *paramāṇu* (discrete ultimate atom) since the beginningless time upto the present time. In the Sūtra "Bhedādaṇuh" the origination of *paramāṇu* by the process of division of skandha has been stated. Therefore, from the point of view of beginningless ultimate atom (*anādi paramāṇu*), it is not proper to call it permanent or eternal, for there takes place in it also a transformation of the qualities like cohesiveness, etc., at every moment. No object is devoid of change. Like the binary compound, etc., an ultimate atom is never produced. Hence it is only cause from the stand-point of substance; decay and origination do not occur in it, so it is permanent (*nitya*). Like this, here is no contradiction of 'evakāra' even¹ in particular alternative 'kāraṇameva.'

An ultimate atom is partless; therefore, there are one taste, one smell and one colour in it. There can be many tastes in sāvayava lemon, etc., and many smells in anulepana, etc. In

1. Kāraṇameva tadantyamityasamīksitābhidhānaṁ; kathañcit kāryatvāt, RV., 5. 25. 5, p. 491;

Avirodha iti cet, na; eva śabdenāvadhāraṇāt,

Ibid., 5.25.6, p. 491;

Nitya iti cāyuktam snehādibhāvenāntiyatvāt,

Ibid., 5.25.7, p. 491;

Anādiparamāṇavavasthamiti cet, na ; tatkāryābhāvāt,

Ibid., 5.25.8, p. 492.

ultimate atoms there are two unopposing touches—any one between cold and warm touches and any one between cohesive and arid touches; the qualities—heaviness, lightness, softness and hardness are not found in an ultimate atom, for they belong to skandha (molecule). The existence of ultimate atoms is proved by the effect-like molecules, e. g. body, sense-organs, elements, etc. It is an agreed principle that the inference of cause is drawn by the mark of effect (*kārya-liṅga*). In the absence of ultimate atoms the molecules-effects cannot be possible.¹ Therefore, that mark can be justified from the point of view of manifoldedness only. An ultimate atom is *syāt-kāraṇa* (some-how cause) because of being a producer of effect-like molecules, such as, binary compounds, etc. It is produced by the process of division of the molecules and is thus *syāt-kārya* (somehow effect) because of being a substratum of the qualities belonging to the effect. There is no smaller division than this ultimate atom; therefore, it is *syāt antya* (somehow last); it is also not *antya* (last) because of the division of its qualities, though there is no division of a unit (*pradeśabheda*). Hence there being fine transformation, it is *syāt sūkṣma* (some-how fine) and it is also gross (*sthūla*) because of having the capacity of producing a gross effect. It does not give up substantiality, so it is permanent; it is non-permanent because of its attaining *skandhaparyāya* (molecule-like mode) and undergoing transformation of its qualities. In the alternative of “*apradeśatva*” (partlessness) it is endowed with one taste, one smell, one colour and two touches; it is also possessed of many tastes, etc., because of there being the capacity of transformation in it to be *anekapradeśī* *skandharūpa-pariṇāma* (transformation as molecules having many units). On account of its being inferable by a mark of an effect it is *syāt kāryalīṅga* (somehow a.

1. Ekarasavarnagāmīdhā aṇuḥ niravayavatvāt,
RV. 5. 25.13, p. 492;

Dvisparśo virodhābhāvāt, Ibid., V. 25.14, p. 492;
Tadasitvāt kāryalīṅgatvāt, Ibid., 15, p. 492.

mark of effect) and it is also not kāryalinga because of being an object of perceptual knowledge.¹

There are stated to be two kinds of paramāṇu,² viz. sūkṣma and vyavahārika (fine and empirical) from the noumenal and phenomenal points of view respectively. One vyavahārika aṇu is constituted of infinite sūkṣma aṇus. It is determined from the aspect of phenomenality (vyavahāra).³ Here it is suggestive that a vyavahārika aṇu may correspond to an atom of the physical sciences, which is divisible, while a sūkṣma aṇu may correspond to electron, proton, neutron, etc. That is to say, this view of modern science that what was comprehended as atom is further splittable into its component parts which are called proton, neutron, electron, etc.

Skandha (Molecule or Aggregate)

An aggregate which ultimate atoms form by combining with one another is called Skandha.⁴ So the second form of Pudgaladravya (material substance) is skandha (molecule or aggregate). All skandhas are formed as aggregate. A skandha is an effect-substance-like (kārya-dravya-rūpa) with regard to its own cause—substance (kāraṇadravya) and it is also a cause-substance-like with regard to its own effect-substance (kārya-dravya) e. g. skandhas having two units (pradeśas) : they are the effects of paramāṇus (ultimate atoms) etc., and also the cause of skandhas having three units (pradeśas) of matter. Therefore, a skandha is an aggregate of paramāṇus (ultimate

1. Anekāntaḥ kāraṇatvādikalpaḥ, RV., 5.25.16
2. Anuyogadvāra of Maladhārī Hemacandra, Sū., 133, and Jambudvīpaprajñapti, 19, Gā., 100, p. 169;
Dvividhaḥ paramāṇuh syāt sūkṣmaśca vyavahārikāḥ
Anantairāṇubhiḥ sūkṣmaireko' aṇurvyavahārikāḥ,
Lokaprakāśa, 1.21.
3. Lokaprakāśa, 1.21.
4. Skandhāstu baddhā eveti/parasparasaṁhatyā vyavasthitāḥ,
TS., Bhā., Tīkā, V. 25, p. 366;
Pariprāptabandhapariṇāmāḥ skandhāḥ, RV., V. 25. 16.

atoms).¹ Skandhas possess a gross and undergo the process of integration and disintegration.² "Skandhas are the aggregates of ultimate atoms which in their gross state can be taken by the hand and handled."³ "If action is present in a few instances by synecdoche it can be extended to others in conventional acceptation. Hence the word 'skandha' is applicable also to molecules consisting of two or more atoms, which cannot be handed, etc."⁴ Though Matter is of infinite varieties, still it is classified into two groups on the basis of ultimate atoms and molecules."⁵

Srī Vinayavijayaji⁶ maintains that a skandha is formed by infinite finest ultimate atoms from the noumenal points of view (Niścayanaya). Skandhas are characterized by sound, combination; fineness, grossness, shape, division, darkness, shadow, heat (sunshine, etc.) light (moonlight, etc.) as well as by touch, taste, smell and colour.⁷ They are of two kinds, viz. bādara (gross—those that can be perceived by the senses)

1. Khaṇḍho paramāṇusaṅgo saṃghādo, PS. 79, p. 62, (Rāyacandra Jaina Śāstramālāyām)
2. Sthūlabhāvena grahaṇanikṣepaṇādīvypāraskandhanat-skandhā iti saṃjñāyante, etc., SS., p. 291.
3. Reality, p. 153.
4. Ibid.
5. Rūdhau kriyā kvacitsati upalakṣaṇatvenāśriyate iti grahaṇādīvypāravyogyeśvapi dvyaṇukādisu skandhākhyā pravartate, anantabhedā'api pudgalā anujātyā skandhajātyā ca dvaividhyamāpadyamānāḥ sarve gṛhyanta iti, SS., V. 25 (comm), p. 297.
6. Vyavahāranayenaiva paramāṇurayaṁ bhavet Skandho anantāṇuko jātasūkṣmatvo niścayātpunāḥ, Lokaprakāśa; ŚI., I. 23.
7. Skandhāḥ punāḥ śabdabandhasaukṣmyasthaulyasāmsthāna-bhedatamaśchāyātаподыотавантаśca sparśādimantaśceti SS., V. 25 (Comm), p. 297.

and sūkṣma (fine—those which are intangible to the senses).¹ Although the capacity of combining with each other is absent in the combination composed of only two elementary particles, they are still called skandhas. Skandhas are stated to be of three kinds from the stand-point of parts, viz. skandha, skandhadeśa and skandhapradeśa. The particular aggregate of infinitefold infinite ultimate atoms is a skandha (molecule), half of it is skandhadeśa and half of that half is skandhapradeśa.² That is, the smallest piece of matter possessing all the characteristic properties of a material substance is the complete skandha (molecule). According to the Nyāya-Vaiśeṣika Philosophy, there are stated to be two forms of Matter, viz. avayava (constituent) part, i. e. paramāṇu and avayavīa (composite whole). Avayava-paramāṇu stands for Jaina paramāṇu and avayavins, such as, dvyaṇuka, etc., represent skandhas of the Jaina system of thought respectively. The relation between an avayava and an avayavīa is that they exist as cause and effect. As an effect the latter inheres in the former which represents the cause. They are related by inheritance, still they are the two distinct entities possessing different attributes and functions.³ In regard to this classification of Matter into two groups the basic difference between Jaina Metaphysics and the Nyāya-Vaiśeṣika is this that the latter accept paramāṇu (ultimate atom) as the ultimate cause, while the former admits it as both cause and effect. So according to the Nyāya-Vaiśeṣika, paramāṇus are the cause of the material Universe and dvyaṇuka (dyad) tryaṇuka (triad), etc., are the effects.

The classification of Matter into two groups, viz. paramāṇu

1. PS., 82;

Pārthivadravyāṇāṁ gandhāḥ tadguṇa ivopalabhyata iti cet; na sādhyatvāt, RV., p. 493.

2. Anantānanta paramāṇubandhaviśeṣaḥ skandhāḥ, tadardham deśaḥ, ardhaṛddham pradeśaḥ, RV., p. 493;
see also GS., JIva, 604.
3. NS., 2. 1. 32-36.

and skandha, is also come across in the Buddhist philosophy in different manner. The Buddhist *kalāpa* or *Saṃghātapaaramāṇu* represents the Jaina paramāṇu. According to the Buddhists, paramāṇus exist always in combination, but not in discrete state. Rāśī is called skandha,¹ whatever matters whether past or future or present, internal or external, gross or fine, less or more (minimum or maximum) distant or near—all these taken together are called rūpaskandha.² The difference between the Jaina and Buddhist views on these two forms of Matter is this that the Buddhist paramāṇu is saṃghāta-paramāṇu consisting of seven or eight or nine or ten material particles; it is not the cause-like paramāṇu of Jaina Metaphysics. The Saṃghāta-paramāṇu of the Buddhists actually corresponds to vyavahārika paramāṇus of the Jainas. According to the physical sciences also, there are mainly two forms of Matter, viz. atom and molecule, although atom is subject to further division into electron, proton, neutron, etc.

Two classes of Matter from the Point of view of Apprehensibility

In Jaina Philosophy Matter has also been classified into two groups from the point of view of apprehensibility by the senses, its tactile quality and its unitariness (*pradeśātmakatā*), viz. sūkṣma and bādara (fine and gross).³ Matters which are

1. *Rāśyādvāragotrārthāḥ skandhāyatanaadhātavaḥ*
Mohendriyaruciitraidhāt tisraḥ skandhādideśanāḥ,
Abh. K., I. Kā 20; see Vibhāṣā, 74, p. 383.
2. See *Samyuktanikāya*, 25. 2;
Yatkīñcid-rūpamatitānāgatapratyutpannam ādhyātmikam vā bāhyam vā audārikam vā sūkṣmam vā hīnam vā prāṇitam vā dūram vā antikam vā tadekadhyamabhisam-kiṣṭiyāyamucyate rūpaskandhāḥ,
Vibhaṅga, p. 1, Vide Abhidharmakośa (Hindi), p. 31.
3. BhS. 8. I. 310 ff:
Duvihā poggalā paṇṇatiā, tamjahā-suhumā ceva bāyarā ceva, Sthānāmga, 82;
Suhumā savvalogammi, logadese ya bāyarā, Utta., 36. 12.

intangible to the senses are called fine pieces of Matter. All ultimate atoms are fine and intangible to the senses. Among molecules also, the constitution (or a structure) of many of them are such that they cannot be apprehended by the senses, e. g. dyad (*dvyāṇuka*), triad (*tryāṇuka*), karmic matter; they are also called fine.¹ Skandhas (molecules) which are tangible to the senses are called gross matter,² e. g. clarified butter, water, oil, etc. That is to say, fine matter is that which is an object for thought-activities and is beyond the sense-perception and gross matter is that which is within the range of sense-perception. As to the second point of view—the tactic quality, it is explained that dviparśin pudgala (matter having two touches), trisparśin (matter having three touches), catursparśin (matter having four touches) and finely transformed matter having eight touches are fine. The remaining molecules having eight touches are gross.³ In regard to the third point that Matter is fine and gross from the point of view of pradeśatmakatā (unitariness or discreteness), it is explained that apradeśin pudgala (partless matter) or ekapradeśin-pudgala (Matter having one unit), dviprudeśin pudgala (molecule having two units), daśapradeśika (molecule having ten units), saṃkhyātpradeśika (molecules having countable units), asaṃkhyātpradeśika (molecules having countless units), and sūkṣma pariṇīta-anantapradeśika skandha (fine-transformed molecule having infinite units) are called fine.⁴ Gross transformed molecules having infinite units (bādarapariṇīta-anantapradeśika skandha) are called gross.⁵ The classification of Matter into

1. Sūkṣmā bhavanti skandha-prāyogyāḥ karmavargaṇāsyā punah, Niyamasāra, 24 (Skt. Chāyā)
2. Sthūlā iti vijñeyā sarpirjalatailādyāḥ. Ibid., 22 (Skt. Chāyā).
3. Ye punaratIndriyadvyaṇukādavo anantāṇukaparyavasānāḥ skandhāḥ sūkṣmāste, TS., T1, p. 373;
Ta eva bādarāsta eva ca punah sūkṣmā iti, Ibid.
4. TS. T1, p. 373.
5. Ibid.

fine and gross can also be made from the point of view of field (kṣetra) and immersion (avagāhanā). The account for these two kinds of Matter is one and the same from the four points of view.

According to the Nyāya-Vaiśeṣika also, Matter has been classified into two groups, viz. aṇu (small) and mahat (great), while the Buddhist philosophy classifies it into two divisions, viz. sūkṣma (fine) and sthūla (gross), just as it is found in Jaina metaphysics. There are stated to be two classes of Matter from the aspect of its capacity to be received and not to be received by Soul, viz. grāhya (receivable) and agrāhya (non-receivable).¹ Matter is received by soul and it can be transformed but it is not receivable to Soul in all conditions. An ultimate atom is not receivable to it. Molecules having two and four touches are non-receivable to it. Only some kinds of molecules having eight touches are capable to be received by it. Therefore, Matter is classified into two groups, viz. grāhya (receivable) and agrāhya (non-receivable) from the point of view of its capacity to be received and not to be received. Matter is viśeṣita (non-particular, i. e. general), while paramāṇu (ultimate atom), dvipradeśika skandha (dyad) upto anantapradeśika skandha (molecule having infinite units) are viśeṣita (particular).² Besides, Matter has been classified into two groups from various points of view, such as, bhinna and abhinna (broken and unbroken), chinna and achinna (disintegrated and non-distintegrated), paramāṇupudgala and na-paramāṇupudgala (atom and molecule),³ baddhapāsapuṭṭha and no-baddhapāsapuṭṭha (deeply attached and not-deeply attached), paryāyātīta and aparyāyātīta, attā and anattā (favourable and unfavourable or received and not-received), iṣṭa and aniṣṭa (desirable and undesirable), manojñā and amanojñā (pleasant and unpleasant), sacitta and acitta (having

1. Pañcama Karmagrantha, 75; Viśeṣāvaśyakabhāṣya, 636-38; GS., JIva, 593-4.

2. Anuyogadvāra, 123.

3. They are already discussed above.

consciousness and without consciousness), śubha and aśubha (auspicious and inauspicious), etc.¹ In this way, Matter has been classified into two groups from various points of view.

Three classes of Matter

Matter has been classified into three groups from the point of view of transformation, viz. prayogapariṇātāpudgala (organic matter), miśrapariṇātāpudgala (organic-cum-inorganic matter), and visrasāpariṇātāpudgala (inorganic matter).² The material substances that are produced by the living organism, vegetables or animals are classified as prayogapariṇātāpudgala (organic matter) and all those material substances which are not prepared from the living organism but from the inanimate objects by the natural innate disposition are classified as visrasāpariṇātāpudgalas (inorganic matters) and all material substances that are the synthetic products of these two processes—vital force and natural force are classified as miśra-pariṇata-pudgalas (matters produced by the mixed processes). That is, matter transformed by the action of beings into the physical form, matter transformed by the action of beings-cum-natural innate disposition and matter transformed

1. Sthānā, 10. 107 (chinna and achinna);

BhS., 14.9.535 (attā and anattā) iṣṭa and aniṣṭa); 7. 10. 308 (acitta); 5. 9. 224 (śubha and aśubha), 14. 8. 553;

Duvihā poggalā, pa. tam-bhinnā ceva abhinnā ceva 1, duvihā poggalā pa. tam-bheuradhammā no-bheuradhammā ceva 2, duvihā poggalā pa. tam-paramāṇupoggalā ceva no-paramāṇupoggalā ceva 2, duvihā poggalā pa. tam-suhumā ceva bāyārā ceva, duvihā poggalā paññattā, tam-pariyāditacceva apariyāditacceva, duvihā poggalā paññattā, tam-atiā ceva anattā ceva, duvihā poggalā pa. tam-iṭṭhā ceva anīṭṭhā ceva, evam kāmī, siya, maṇūṇī, maṇāmā, Sthā., 2. 82; See Anuyoga. 123.

2. Tivihā poggalā paññattā, tamjāhā payogapariṇātā, missapariṇayā vīśasā-pariṇayā, BhS., 8.1.309; see Sthānāṅga, 3. 186.

by the natural process form the three classes of Matter from the point of view of transformation. Matters which have been transformed by beings on receiving them are called prayoga-parinata (organic matter) and matter which have been transformed by the action of beings, but now being given up by the action of them, (they) are themselves undergoing transformation by the natural process, are stated to be miśraparinata-pudgala. That is, matter in which there takes place simultaneously a transformation by the action of the being and by the innate nature is called miśraparinatapudgala. Matter in which there occurs a transformation by its own innate nature or in the transformation of which there is no help of any being, is called visrasāparinatapudgala (inorganic matter).

These three classes of Matter have been divided into many sub-classes from various points of view. For example, there are stated to be five kinds of prayoga-parinatapudgala, viz. ekendriya-prayogaparinata-, dvīndriya-prayoga-parinata-, triṇdriya-prayoga-parinata-, caturindriya-prayoga-parinata- and pañcendriya-prayoga-parinata-pudgalas. Ekendriya-prayoga-parinata-pudgalas are of five kinds, viz. pṛthivīkāyika-prayoga-parinata-pudgala, ap-kāyika-prayoga-parinata-pudgala, taijasa-kāyika-prayoga-parinata-pudgala, vāyukāyika-prayoga-parinata-pudgala, and vanaspatikāyika-prayoga-parinata-pudgala. That is to say, matters transformed by the actions of one-sensed earth-bodied, water-bodied, fire-bodied-, air-bodied- and plant-bodied-beings respectively. They are again sub-divided into two main groups, viz. sūkṣma (fine) and bādara (gross) so on. Miśra-parinata-pudgala are of five kinds, viz. ekendriya miśra-parinata-pudgala up to pañcendriya-miśra-parinata-pudgala. They are again subdivided into many kinds up to āyata-saṁsthāna-parinata-pudgalas.¹

Visrasā-parinata-pudgala is of five kinds, viz. varṇaparinata, gandhaparinata, rasaparinata, sparśaparinata and saṁsthānaparinata. They are again sub-divided into many groups

1. BhS., 8. 1. 311.

according to their respective numbers, e. g. varṇapariṇata-pudgala is of five kinds, viz. kālavarṇa-parinata up to śukla-varṇapariṇata, and so on.¹

The Jaina view on these three classes of Matter is well supported in the organic chemistry.² It is explained there that all those which could be obtained from vegetables or animals, i. e., substances that were produced by the living organism, were classified as organic; and all those substances which were not prepared from the living organism were classified as inorganic.

At this stage of investigation of organic compounds it appeared that there were the definite differences between organic and inorganic compounds, e. g. complexity of composition and combustibility of the former. Berzelius (1951) thought that organic compounds were produced from their elements by laws different from those governing the formation of inorganic compounds. This then led him to believe that organic compounds were produced under the influence of a vital force, and that they could not be prepared artificially.

"In 1828, Wohler converted ammonium cyanate urea, a substance hitherto obtained only from animal sources. This synthesis weakened the distinction between organic and inorganic compounds, and this distinction was completely ended with the synthesis of acetic acid from its elements by Kolbe in 1945, and the synthesis of methane by Berthelot in 1956. A common belief appears to be that Wohler's synthesis had little effect on the vital force theory because it did not start with elements. Wohler had prepared his ammonium cyanate from ammonia and cyanic acid, both of which were of animal origin. Partington (1960), however, has pointed out that Priestley (1781) had obtained ammonia by reduction of nitric acid, which was later synthesised from its elements by Cavendish (1785). Also, potassium cyanide was obtained by Scheele

1. BhS. 8. 1. 312.

2. Organic Chemistry, Vol. I. I., L. Finar, Ch. I., pp. 1-2.

(1783) by passing nitrogen over a strongly heated mixture of potassium carbonate and carbon, and since one form of carbon used graphite, this reaction was, therefore, carried out with inorganic materials. Since potassium cyanide is readily converted into potassium cyanate, Wohler's synthesis is one which starts from the elements. Since the supposed differences between the two classes of compounds have been disproved, the terms organic and inorganic would appear to be no longer necessary. Nevertheless, they have been retained, but it should be appreciated that they have lost their original meaning."¹

Four classes of Matter

Matter is also classified into four groups from the point of view of parts of skandha (molecule), viz. skandha (molecule) skandhadeśa (part of aggregate), skandhapradeśa (unit of aggregate) and paramāṇu (ultimate discrete atom)¹. As pointed out, there are two main forms of Matter, viz. paramāṇu and skandha (molecule). Here the four classes of matter have been described by making three divisions of skandha into (1) skandha (aggregate), skandhadeśa (part of aggregate) and skandhapradeśa (unit of aggregate) respectively and by adding paramāṇu into this classification. The aggregate of combined ultimate atoms is called skandha. The part of skandha which again can be divided is called skandhadeśa. There the division of skandhas having two upto infinite constituent elements is stated to be deśa. Whatever paramāṇus having been combined, are formed into a skandha, (that much) are the pradeśas (units) of it, i. e. the units of the undivided skandha having the extent of an ultimate atom (paramāṇu), even when combined in a skandha, is known to be pradeśa. The indivisible

1. Organic Chemistry, Vol. 1, pp. 1. 2.

2. Je rūvī te cauvvihā paññattā, tamjahā khamdhā, khamdhadesā, khamdhapaesā, paramāṇupoggalā,
BhS., 2.10. 119;
see Jīvābhigama, 5.
Uttarā, 30.10; Anuyogadvāra. 142.

matter in its discrete state is called paramāṇu. They are thus described from the point of view of gross state for the aggregate of combined ultimate atoms, which is full in all parts, is stated to be a skandha, the half of it is called deśa and the half of that half is pradeśa and the indivisible unit is paramāṇu.¹ The Jaina deśa and pradeśa of a skandha correspond to avayav and avayava of the Nyāya-Vaiśeṣika respectively.

Six classes af Matter

In Jaina Philosophy Matter is classified into six groups from the stand-point of grossness and fineness in its size, viz. bādarabādara, bādara, bādara-sūkṣma, sūkṣma-bādara, sūkṣma and sūkṣma-sūkṣma² (grossest, gross, gross-fine, fine-gross, fine and finest). Pudgala-skandha (molecule) whose chedana (penetrability of penetration or cutting), bhedana (division or divisibility) and prāpāna (portability) may generally be possible is called bādara-bādara (grossest), e. g. solids like earth, stone, etc. Pudgala-skandha whose penetration and division are not possible but portability can be possible is called bādara (gross), e. g. liquids like molten butter, water, oil, pudgala-skandha whose penetration and division and portability can not be possible at all, but which is apprehended by the eyes is called bādara-sūkṣma (grossfine), e. g. heat, light, electricity and magnetism. The ultra visible but intra sensual-molecules tangible to the four sense-organs except the visual organ are called sūkṣma-bādara (fine-gross), e. g. gases with air and others. The molecules which are ultra-sensual matters are called sūkṣma (fine). It is responsible for thought activities and is beyond the sense-perception. The finest ultimate-atom is called sūkṣma-sūkṣma, because firstly, it is the finest of all forms of matter,

1. Khaṇḍham̄ sayaśasamatthaṁ tassa ya addham̄ deso iti
Addhaddham̄ ca padeso avibhāgī ceva paramāṇu,
GS., Jīva., 604.
2. Bādara-bādara bādara-suhumam̄ ca suhumabādaram̄
ca Suhumam̄ ca subumasuhumam̄ dharādiyam̄ hodi chab-
bhēyam̄", GS., Jīva., 602; see Niyamasāra, 21.

secondly, only paramāvadhijñānin (one endowed with transcendental knowledge) and Kevalajñānin (omniscient) can apprehend it. Other persons can know it only by inference with regard to the mark of its effect.¹

It is to be noted here that these six divisions of Matter—grossest to finest can be reduced to the three divisions of Matter in the physical sciences in three states, viz. solid, liquid and gaseous. The remarkable feature in them is that the molecular structure is common to all the three states, whereas the difference lies only in the closeness with which the molecules comprising them are packed.

In a solid, the molecules are put closely together, so the intermolecular forces of cohesion are greater than the molecular tendency to disintegrate. As a result of this fact the molecules are held to each other with a strong force which enables a solid to maintain a definite shape and volume and to put a great resistance to any change in either of them. For this reason a solid possesses high rigidity, high volume and elasticity.

In a liquid, the molecules are placed less closely together than they are packed in a solid, so a liquid promptly submits to any external force tending to change its shape on account of much smaller cohesion in it. Thus it has no definite shape, but it can maintain its volume and quite large force, though comparatively smaller than that in a solid to change it a little.

1. GS., Jīva., 603;

Bhūpavvadamādiyā bhaṇidā aithūlathūlamidi khamdhā
 Thūlā idī viñneyā sappijalatelamādiyā—Niyamasāra, (22);
 Chāyātavamādiyā thūledarakhamdhāmidi viyāṇāhi
 Suhumathūledi bhaṇiyā khamdhā caurakkhavisaya ya,
 Ibid. (23);
 Suhumā havarānti khamdhā pāvoggā kammavaggaṇapassapuṇo
 Tavvivarīyā khamdhā aisuhumā iti purūvemdi,
 Ibid. (24)

In a gas, the molecules exist widely separated from each other, hence intermolecular attraction is almost absent and they move about as being independent of each other within the limitation of the walls of the containing vessel. It cannot preserve any definite shape or volume but pervades the whole of the containing vessel readily. So it cannot offer any appreciable resistance to any change either in shape or in volume.

TWENTY-THREE VARGAÑĀS (CLASSES) OF MATTER

The group of matters of the same numerical value is called vargañā (class). As for example, individual ultimate atoms (paramāṇus) which exist in the entire cosmic universe (lokākāśa) is called the first vargañā. The aggregate which is formed by the combination of two ultimate atoms is called the second vargañā. The aggregate which is formed by the combination of three ultimate atoms is stated to be the third vargañā. In this way, on the increase of one – one ultimate atom the aggregates (skandhas), having countable, countless and infinite and infinitefold infinite units of matter are to be known as saṁkhyātānuvargañā, asaṁkhyātānuvargañā, anantānuvargañā and anantānantānuvargañā¹ respectively.

All these vargañās, because of having alpaparamāṇus (less or small quantity of ultimate atoms) cannot be received by soul. For this reason these are called agrāhya or agrahaṇa vargañās (non-receivables). But the aggregates which are formed of ultimate atoms which are infinite times more than the number of abhavya-jīvas (beings unfit to attain liberation) and infinite part of siddhajīvas (perfect beings or souls), i. e. the aggregates in which there are such numbers of ultimate atoms are receivable by Soul.

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- I. Igadugañāgāi jā abhavañāmtaguniyānū
Kham dhā uralociyavaggañā u taha agahañāmṭariyā,
Pañcama Karmagrantha, 75.

On receiving them, Soul transforms its own gross body. For this reason these aggregates are called audārika vargaṇā. But this vargaṇā is the most minimum of all the receivable vargaṇās of the gross body. In addition to it, there being an increase of ultimate atom by the gradual order of one unit (pradeśa), the first, the second, the third, the fourth, the fifth, etc., upto infinite vargaṇās of skandhas become grāhya vargaṇās (receivable classes) of the gross body. Therefore, the receivable maximum vargaṇās of the gross body becomes more by the infiniteth part than the receivable minimum vargaṇās of the gross body. In this infiniteth part there are infinite ultimate atoms. So the vargaṇās from the minimum to the maximum should known as the grāhya vargaṇās (receivable classes) of the gross body.

In addition to the maximum vargaṇā of the gross body, the vargaṇās of skandhas which are formed as a result of the increase of ultimate atoms by the order of one unit (pradeśa) to each of them are firstly possessed of more number of units of ultimate atoms than that of the gross body on the one hand; secondly they are fine; therefore, they become grāhya vargaṇās (receivable classes) of the gross body. And they are having less number of units of ultimate atoms and are grosser than skandhas of which the transformable-body (vai-kriyika śarīra) is formed. Therefore, they are not capable of being received by the transformable body. Thus ananta vargaṇās (infinite classes) of skandhas, because of there being an increase of ultimate atoms by the order of one unit (of ultimate atom) to each of them in addition to the maximum vargaṇā of the gross body (audārika śarīra), become unfit to be received (i. e. non-receivable). As for example, the maximum vargaṇās of the gross body is more by infiniteth part than its receivable minimum vargaṇās. Similarly, the non-receivable maximum vargaṇā should be known to be infinite times more (i. e. having infinitefold ultimate atoms) than the non-receivable minimum vargaṇā. In this way the receivable vargaṇās are alternately placed, i. e. there comes the non-

receivable vargañā after the receivable vargañā and the receivable vargañā after the non-receivable vargañā.¹

The collection-like (group-like) vargañā of those skandhas in which there is found one ultimate atom more than the number of ultimate atoms existing in a skandha of non-receivable maximum vargañā is the receivable minimum vargañā of the transformable body (vaikriyika śarīra). The collection-like (group-like) second vargañā of those skandhas in which there is found one more unit of ultimate atom than the number of units (of ultimate atoms) of the minimum vargañā is the receivable vargañā of the transformable body (vaikriyika śarīra). Like this infinite vargañās of skandhas having an addition of ultimate atoms by the order of one unit (of ultimate atom) more to each of them become the receivable vargañās of the transformable body. Therefore, the receivable maximum vargañā of the transformable body becomes more by the infiniteth part than its receivable minimum vargañā. The vargañā which is of skandhas having one unit more than the receivable vargañā of the transformable body is having much more units than the transformable body and is fine; and it is having less number of units than the translocation body (āhārakaśarīra) and is grosser than it. Therefore, it is neither useful to the transformable body nor to the translocation-body. For this reason it is called non-receivable vargañā. It is the minimum vargañā. In addition to it, the infinite vargañās of skandhas having the increase of units (of ultimate atom) by the order of one unit are non-receivable. The vargañā of

1. Egā paramāṇuṇam eguttaravaḍḍhiyā tao kamaso
Saṅkhejjapaesāṇam saṅkhejjā vagganā homti. 636
Tatto saṅkhāīā saṅkhāīyappaesamāṇāṇam
Tatto puṇo aṇamītāṇamītapaesāṇa gaṇtūṇam
Orāliyassa gahaṇappāoggā vagganā aṇamītāo 637
Aggahaṇappāoggā tasseva tao aṇamītao 638
Evamajoggā joggā puṇo ajoggā ya vagganāṇamītā,
Viśeṣāvāsyakabhāgya, 636, 637, 638.

skandhas having one unit more than the non-receivable maximum vargaṇā becomes the receivable minimum vargaṇā of the translocation-body (āhāraka śarīra). There becomes the receivable maximum vargaṇā of skandhas of the translocation-body, having the number of more units by the infiniteth part than this minimum vargaṇā of the translocation-body.

There becomes the non-receivable minimum vargaṇā of the skandhas having one atomic unit more than the receivable vargaṇā of the translocation-body. In addition to that, there being an increase of atomic units infinite times more than the minimum vargaṇā by the order of one atomic unit, there becomes the non-receivable maximum vargaṇā. Thus these infinite vargaṇās are having much more atomic units than the translocation-body and are fine; and they are having less number of atomic units than the luminous-body, and are grosser than it; therefore, they are not receivable. The vargaṇā of skandhas having one atomic unit more than the maximum non-receivable vargaṇā becomes prāyogyajaghanya vargaṇā of the luminous-body. There being an increase over that by the order of one atomic unit, there becomes the maximum vargaṇā of skandhas having infiniteth part more atomic unit of prāyoga (applicable) minimum vargaṇā of the luminous-body.

There becomes the minimum non-receivable vargaṇā of skandhas having one atomic unit more than a skandha of the receivable maximum vargaṇā of the luminous-body. In addition to that, there being an increase of atomic units by the order of one atomic unit, there becomes the maximum non-receivable vargaṇā of skandhas having atomic units infinite times more than the minimum non-receivable vargaṇā. Like this these infinite non-receivable vargaṇās are having much more atomic units than the luminous-body and are fine, and they are having less number of units than speech and are grosser than it. Therefore, they are not receivable. The vargaṇā of skandhas having one unit more than the maximum non-receivable vargaṇā, becomes the bhāṣā-prāyoga-jaghanya-vargaṇā.

(minimum vargaṇā fit to be speech). In addition to that, there being the increase of units by the order of one, there becomes bhāṣā-prāyoga-utkṛṣṭa-vargaṇā (maximum vargaṇā fit to be speech) of skandhas having units more by the infiniteth part than the minimum vargaṇā. Thus the infinite vargaṇās become receivable in the case of bhāṣā.

There becomes the non-receivable minimum vargaṇā of skandhas having one unit more than skandhas of receivable maximum vargaṇā of bhāṣā. In addition to that, there being an increase of units by the order of one unit, there takes place the non-receivable maximum vargaṇā of skandhas having units infinite times more than the receivable vargaṇā. The vargaṇā of skandhas having one unit more than skandhas of this vargaṇā becomes the receivable minimum vargaṇā of respiration. In addition to it, there being an increase of units by the order of one unit, there becomes the maximum non-receivable vargaṇā of respiration of skandhas having infiniteth part more (unit) of the units of skandhas of the minimum vargaṇā.

There becomes the non-receivable minimum vargaṇā of skandhas having one unit more than skandhas of the receivable maximum vargaṇā of respiration. In addition to that, there being an increase of units by the order of one unit, there becomes the maximum non-receivable vargaṇā of skandhas having units infinite times more than the units of skandhas of the minimum non-receivable vargaṇā. There becomes manodravya's (mind-substances) receivable minimum vargaṇā of skandhas having one unit more than skandhas of that vargaṇā (respiration). In addition to that minimum vargaṇā, there being an increase of units by the order of one unit, there becomes the manodravya's receivable maximum vargaṇā of skandhas having the infiniteth part more unit than the units of the skandha of the minimum vargaṇā.

There becomes the non-receivable minimum vargaṇā of the skandhas having one unit more than the receivable maximum

vargaṇā of the mind-substance. In addition to that, there being an increase of units by the order of one unit, there takes place the non-receivable maximum vargaṇā of skandhas having units infinite times more than the units of the skandhas of the minimum vargaṇā. The vargaṇā of skandhas having one unit more than the units of skandhas of this maximum vargaṇā is the receivable minimum vargaṇā of karma (fit to be received). In addition to that, there being an increase of units by the order of one unit, there becomes karma's receivable maximum vargaṇā of skandhas having infiniteth part more unit of the minimum vargaṇā.¹

In brief it can be summed up that there are infinite times more ultimate atoms in one aggregate of the maximum non-receivable vargaṇā than whatever number of ultimate atoms are existing in one aggregate of the minimum non-receivable vargaṇā and there are infiniteth part more ultimate atoms in the aggregates of the maximum receivable vargaṇā than whatever number of ultimate atoms are existing in the aggregates of one minimum receivable vargaṇā. In this way eight vargaṇās are receivable and eight vargaṇās are non-receivable. From amongst these sixteen vargaṇās there are stated to be two main alternatives of each of them and there are infinite intermediate alternatives between the minimum and the maximum (or from the minimum to the maximum). The maximum of the receivable vargaṇā is the infiniteth part more than its minimum and the maximum of the non-receivable vargaṇā is infinite times more than its minimum. Thus there are stated to be eight receivable vargaṇās, viz. receivable vargaṇās of gross—, transformable—, translocation— and luminous-bodies, speech, respiration, mind and karma (karmic body).²

1. Pañcamakarmagrantha, p. 211;
see Notes of Pandit Sukhlalji.

2. Emeva viuvvā-hāra-teya-bhāsa-nupāṇa-maṇa-kamme
Suhumā kamāvagāho ṫīmūṇaṅgula-asamīkhamīso,
Pañcamakarmagrantha, 76

The five kinds of bodies—audārika (gross) upto kārmāṇa (karmic body) are finer by the successive order; nevertheless, the use of ultimate atoms is made more and more in their respective formations. As for instance, though cotton, wood, earth, stone and iron are accepted in some particular magnitude or quality (parimēṇa), still the size of wood is smaller than that of cotton, that of earth is smaller than that of wood, that of stone is smaller than that of earth and that of iron is smaller than that of stone. But these things, even being smaller in size from one another, are more solid and heavy by the successive order. Just like that the account of the five bodies should be understood. The reason is this that pudgalavargaṇās of which the gross body is formed are having less number of ultimate atoms like cotton, but they are gross in size ; pudgalavargaṇās of which the transformable body is constituted are having more number of ultimate atoms than that of pudgala-vargaṇā fit to be gross body like wood, but they are less in size. In this way the account of the bodies should be known according to the successive order. It means that the number of ultimate atoms increases more and more in the cases of successive vargaṇās, but their size becomes finer and finer. That is to say, as there takes place a combination of more ultimate atoms, so there occur their finer and finer transformations¹ successively. Therefore, the immersion of audārikavargaṇās is innumerableth part of a cubic finger and that of its non-receivable vargaṇā is also innumerableth part of one cubic finger, but the innumerableth part of this cubic finger is less than the previous one. Like this the immersion of vairikyika-grahaṇavargaṇā also is the innumerableth part of a cubic finger, but this innumerableth part is less than the innu-

1. Param param sūkṣmaṇi, pradeśato asamīkheyaguṇam
prāk tejasāt, TS., 2. 38, 39 ;

Anantaguṇe pare, Ibid., 2.40; Apratighāte, Ibid., 2.41

The closeness of atoms makes the body compact and solid by virtue of cohesion according to the physical sciences.

merableth part of a cubic finger having the immersion of audā-rikagrahanayogyavargaṇā (pudgalavargaṇā fit to be received for the formation of gross body). Similarly, the innumerableth part of a cubic finger should be understood lesser and lesser also. On account of this decrease (nyūnatā) even there being the perception of the gross body having less number of ultimate atoms, the co-existent luminous and karmic bodies having much more number of ultimate atoms successively are not perceptible.

Speech, respiration and mind lie in between the luminous and karmic bodies. That is, vargaṇās which undergo transformations as sound at the time of speaking are finer than the receivable vargaṇās of the luminous body. And vargaṇās which undergo transformation as respiration of beings are finer than these bhāṣāvargaṇās. From this fact, it is inferable how much more fine are karmavargaṇās, but the number of ultimate atoms are more in them. This analysis throws light upon the outlines of the nature of those things which undergo transformation as karma.

In addition to these karmavargaṇās, there are stated to be the following vargaṇās, viz. dhruvavargaṇā (fixed molecule), sāntaranirantara-vargaṇā (Inter-non-inter-molecule) (or adhruvavargaṇā—non-fixed molecule), śūnyavargaṇā (indifferent molecule), pratyekasārīrvargaṇā (individual body-molecule), dhruva-śūnya-vargaṇā (fixed indifferent molecule), bādaranigoda-vargaṇā (gross-common-body-molecule), śūnyavargaṇā (indifferent molecule), sūkṣmanigoda-vargaṇā (finer-common-body-molecule), śūnyavargaṇā or nabhvargaṇā (indifferent or sphere-molecule) and mahāskandhavargaṇā (great molecule).¹

1. Aṇusamkhāsaṁkhejjāṇamṭā ya agejjagehim ar̄mtariyā,
Āhāratejabhāsāmaṇakammaiya dhuvakkhaṁdhā,
Sāṁtaraniraṁtarena ya sunnā patteyadehadhuvasunṇā
Bādaranigodasunṇā subhumanigodā nabho mahakkamdhā,
GS., Jīva , 594, 595, p. 294;

It appears from the above analysis of vargaṇās of Pudgala that whatever is visible is not the final units of Matter.

Five hundred and thirty classes of Matter

In Jaina Metaphysics Matter has been classified into five hundred thirty groups from the point of view of the prominence of its qualities—colour, taste, smell, touch and shape on the basis of their respective predominance in their substratum. It has been divided into one hundred groups by accepting colour as primary and other qualities as secondary $5 + 2 + 8 + 5 = 100$, one hundred groups by accepting taste as primary and others as secondary, forty-six groups by regarding smell as primary and others as secondary, one hundred eighty four groups by accepting touch as primary and others as secondary and one hundred groups by accepting shape as primary and others as secondary.¹ Thus the total number of these classes of Matter is five hundred and thirty.

It is stated in the Prajñāpanā Sūtra that those which are kālavarṇapariṇātā-pudgalas (black-coloured-transformed matters) with regard to colour are surabhigandha-pariṇata and durabhidhigandha-pariṇata (pleasant and unpleasant-smell-transformed) with regard to smell; tiktarasapariṇata (bitter taste-transformed), kaṭukarasapariṇata (sour-taste transformed), kaṣāyarasapariṇata (astringent taste-transformed), amlarasapariṇata

Paramāṇusaṁkha-asaṁkha-apaṁta-paesā abhavvaṇaṁtaguṇā Siddhāṇaṁtabhāgo āhāragavaṅgaṇā titanū (18)

Agahaṇaṁtariyāo teyagabhbāmaṇe ya kamme ya

Dhuva-adhuva-accittā sunṇa-cau-aṁtaresuppiṁ (19)

Patteyagataṇusa bāyarasuhuma—nigoe tahā mahakkhaṁdhe Guṇanippahannasanāmā asaṁkhabhbāgaṅgulavagāho (20)

Karmaprakṛti (Bandhana-karaṇa)

Kammovariṁ dhuveyarasunṇā patteyasyunṇabāyariyā (16)

Sunṇā suhumā sunṇā mahakkhaṁdho saguṇanāmāo

Pañcasamāgraḥ, Bandhanakaraṇa, Vide Pañcamakarma-grantha, p. 214.

1. Paṇṇavānā, I. Rūvī ajīvapāṇṇavānā.

(acidic-taste-transformed), and madhurarasapariṇata (sweet-taste-transformed) with regard to taste, karkaśasparśa-pariṇata (hard touch-transformed), mṛduśparśapariṇata (soft touch-transformed), gurusparśapariṇata (heavy-touch-transformed), laghusparśa-pariṇata (light-touch-transformed), śīṭasparśapariṇata (cold-touch-transformed), uṣṇasparśapariṇata (hot-touch-transformed), snigdhasparśapariṇata (smooth or cohesive touch-transformed), and rūkṣasparśapariṇata (rough or dry touch-transformed) with regard to touch; parimaṇḍalasaṁsthānapariṇata (spherical shape transformed), vṛttasaṁsthānapariṇata (circular shape-transformed), tasrasaṁsthānapariṇata (triangular shape-transformed), caturasrasaṁsthānapariṇata (square shape-transformed) and āyata-saṁsthānapariṇata (rectangular shape-transformed) with regard to shape (20). Those which are nīla-varṇapariṇata (blue-colour-transformed) from the point of view of colour are surabhigandhapariṇata and durabhigandhbapariṇata from that of smell, tiktarasapariṇata, kaṭukarasapariṇata, kaśāyarasapariṇata, amlarasapariṇata and madhurarasapariṇata from that of taste; karkaśasparśapariṇata, mṛduśparśapariṇata, gurusparśapariṇata, laghusparśapariṇata, śīṭasparśapariṇata uṣṇasparśapariṇata, snigdhasparśapariṇata and rūkṣasparśapariṇata from that of touch; parimaṇḍala-saṁsthānapariṇata, vṛttasaṁsthānapariṇata, tasrasaṁsthānapariṇata, caturasrasaṁsthānapariṇata and āyatasaṁsthānapariṇata from that of shape (20). Those which are lohitavarṇapariṇata (red colour-transformed) with regard to colour are surabhigandhapariṇata and durabhigandhbapariṇata with regard to smell, tiktarasapariṇata, amlarasapariṇata and madhurarasapariṇata with regard to taste; karkaśasparśapariṇata, mṛduśparśapariṇata, gurusparśapariṇata, laghusparśapariṇata, śīṭasparśapariṇata, uṣṇasparśapariṇata, snigdhasparśapariṇata and rūkṣasparśapariṇata with regard to touch, parimaṇḍalasaṁsthānapariṇata, vṛttasaṁsthānapariṇata, tasrasaṁsthānapariṇata, caturasrasaṁsthānapariṇata and āyatasaṁsthānapariṇata (20), with regard to shape. Those which are haridravarṇapariṇata (yellow colour-transformed) from the point of view of colour.

are surabhigandhapariṇata and durabhigandhapariṇata (pudgala) from that of smell; tiktarasapariṇata, kaṭukarasapariṇata, kaśāyarasarapariṇata, amlarasapariṇata and madhurarasapariṇata from that of taste, karkaśasparśapariṇata, mṛdusparśapariṇata, gurusparśapariṇata, laghusparśapariṇata, śītasparśapariṇata, uṣṇasparśapariṇata, snigdhasparśapariṇata and rūkṣasparśapariṇata from that of touch; parimaṇḍalasaṁsthānapariṇata, vṛttasaṁsthānapariṇata, tasrasaṁsthānapariṇata, caturasrasaṁsthānapariṇata and āyatasaṁsthānapariṇata from that of shape (20). Those matters which are śuklavarmṇapariṇata (white colour—transformed) from the aspect of colour are surabhigandhapariṇata and durabhigandhapariṇata from that of smell, tiktarasapariṇata, kaṭukarasapariṇata, kaśāyarasarapariṇata, amlarasapariṇata and madhurarasapariṇata from that of taste; karkaśasparśapariṇata, mṛdusparśapariṇata, gurusparśapariṇata, laghusparśapariṇata, śītasparśapariṇata, uṣṇasparśapariṇata, snigdhasparśapariṇata and rūkṣasparśapariṇata from that of touch; parimaṇḍalasaṁsthānapariṇata, vṛttasaṁsthānapariṇata, tasrasaṁsthānapariṇata, caturasrasaṁsthānapariṇata and āyatasaṁsthānapariṇata from that of shape (20). Thus there are stated to be one hundred groups of matter in this classification from the stand-point of predominance of colour as primary quality and non-predominance of other qualities as secondary.

In this way Matter has been classified into the remaining four hundred thirty groups from the points of view of predominance of smell, touch and shape respectively. It is to be analysed whether the quality of primary as well as secondary importance in the transformed piece of matter is inherent in the component parts of it or emergent from the aggregation due to some chemical behaviour in it.

According to the physical sciences, it can be said in regard to colour, taste and odour that colour is the important physical property and the apparent colour of a material substance is conditional upon its state of sub-division; it becomes lighter as large particles are grouped up into smaller ones. Taste and

odour are the chemical properties in the matter as they are closely correlated with the chemical nature of the material substances.

Infinite classes of Matter

There are stated to be infinite classes¹ of matter with regard to its jāti (category)—anujāti (ultimate atom) and skandhajāti (molecule). All ultimate atoms are not of the same conditions. All the conditions of qualities of colour, taste, smell and touch do not exist in one ultimate atom. There may exist in one ultimate atom any one colour, any one taste, any one smell and any two unopposed touches between warm-cold and cohesive-dry. Ultimate atoms in which similar colour, taste, smell and two touches exist will be stated to be belonging to one jāti (category). Similarly, ultimate atoms are of different jāti (category) due to the cause of possible combinations of the sub-divisions of colour, taste, smell and touch. Like this skandha (aggregate) is of various jātis (category). In the Rājavārtika, while commenting on the aphorism “Āṇavah skandhāśca”, Akalaṅka explains it in this manner; “Ubhayātra jātyapeksam bahuvacanam—anantabhedā’api pudgalā anujātyā skandhajātyā ca”. In this sūtra the use of these plural words “āṇavah” and “skandhāḥ” has been made from the point of view of jāti. Matter is of infinite classes from the point of view of anujāti and skandhajātis. He has explained it further by stating : “dvividhyamāpadyamānāḥ sarve gṛhyanta iti tajjātyādhārānantabhedasamśūcanārtham bahuvacanam kriyate.”

Infinite classes of Matter² are discussed from the state of

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1. BhS., 25. 4. 740; Ubhayātra jātyapeksam bahuvacanam (3) anantabhedā’api pudgalā anujātyā skandhajātyā ca dvividhyamāpadyamānāḥ sarve gṛhyanta iti tajjātyādhārānantabhedasamśūcanārtham bahuvacanam kriyate, RV., p. 491.
 2. BhS., 25. 4. 740; BhS. 20. 5. 670; TS., p. 439.

the part of its quality. There is the degree of the capacity in the characteristics of Matter—colour, taste, smell and touch. As for example, blackness in black coloured matters is not equal in all of them. Some one is of onefold blackness, i. e. the lightest blackness in comparison with which there cannot be any lightest black colour—indivisible part of blackness which is unitary; some may be numerablefold black; some may be innumerablefold black and some may be infinitefold black. This degree of qualities exist in both ultimate atoms and molecules. In this way Matter has been classified into infinite groups from the points of view of the degree of the parts of its qualities—colours, tastes, smells and touches.¹

There are also infinite classes of Matter with regard to its modes. Matter is subject to modification on account of the process of combination and dissociation. Matter undergoes modifications by the process of integration into the forms of colour, taste, smell, touch and shape and thus it assumes vyāñjanaparyāyas, (periodic modifications.) From the point of view of the these infinite modes, Matter has been classified into infinite groups, as for instance, sound, heat, light, darkness, water, earth, cloud, etc.² The classification of Pudgala (Mattar) into infinite groups from the points of view of jāti (category), part of quality (guṇāṁśa) and mode or modification is comparable to the analysis of matter of the physical sciences from the point of view of subject (substance), predicate (quality) and relations (modes).

1. Jaina Padārtha-vijñāna men Pudgala, pp. 41-49.

2. Ibid., p. 50.

EIGHT CHAPTER

ATOMIC STRUCTURE OF MATTER AND PROPERTIES OF ATOM

FIRST SECTION

ATOMIC STRUCTURE OF MATTER

In continuation of the fourth chapter on Atomism it is necessary further to have a detailed discussion of the atomic structure of Matter, the nature and properties of atom in relation to the Brāhmanical and Buddhist views on them.

In Jaina Philosophy paramāṇu (ultimate atom) is studied from the points (locus or field), kāla (time) and bhāva (condition), as it is the finest particle of Matter the further division of which is not possible; it is identical with one space-point and one unit of time (kṣaṇa-samaya), and is endowed with quality and it is ever changing in nature.¹

Paramāṇu is an indivisible unit of Matter; it is the finest of all forms of Matter; the finest point of space is an indivisible one space-point; the finest unit of time is an indivisible instant; and the finest unit of quality of Matter is bhāva-paramāṇu (atom of quality). So Jaina Metaphysics mentions dravya-paramāṇu (atom of material substance), kṣetraparamāṇu (atom of space), kālaparamāṇu (atom of time) and bhāva-paramāṇu (atom of quality).²

1. From the general point of view Paramāṇu is one “egeparamāṇu”, Sthā. I;
BhS., 25. 4. 70; 20. 5. 670; Ācārāṅga Cūrṇi, p. 195;
Uttarādhyayana Sūtra, Tīkā (Kamala Saṃyama), p. 99.
2. Goyamā ! cauvvihe paramāṇu pa. tam--davvaparamāṇu,
khettraparamāṇu, kālaparamāṇu, bhāvaparamāṇu,
BhS., 20. 5. 670.

One point of space is the last limit of the division of space, i. e. partless. As pointed out, paramāṇu is partless, it has no inner and outer parts. That is why it is the finest particle of Matter from the point of view of field or locus; it exists only in one space-point. It is a momentary unit in this sense that a samaya or kṣaṇa is the indivisible unit of time, so also paramāṇu is an indivisible unit of Matter; the movement of a paramāṇu from one space-point to another is measured by a samaya or kṣaṇa (instant), for this reason it is identical with a momentary unit of time. The properties of a paramāṇu are also in a state of flux, undergoing transformation. A paramāṇu is so finest in form that it is touched by air, but it does not touch air.¹

The Jaina Ācāryas of both the Śvetāmbara and Digambara traditions have used this word "Paramāṇu" and interpreted it in the following manner : Paramāṇu is the cause of the formation of pudgalakandha (molecule); it comes into being out of the division of skandha at last². Hence it is the smallest and finest form of Matter and it is permanent.³ It is eternal from the point of view of substance and non-eternal from that of condition of colour, smell, taste and touch.⁴

Causative Atom and Ultimate Discrete Atom (Kāraṇāṇu and Anantāṇu)

Dravyaparamāṇu (atom of material substance) is called paramāṇupudgala (atomic matter) from the general point of

1. Gayamā ! paramāṇupoggale vāyuāṇam phude no vāyū-āye paramāṇupoggaleṇam phude, BhS., 18. 10. 644.
2. Goyamā ! esa nām poggale titam ceva jāva egaruve siya, Bhs., 14. 4. 510;
Bhedādaṇuh, TS., V. 27.
3. Sūkṣmo nityaśca bhavati paramāṇuh, Uttarā. Tīkā (Śānti Ācārya, p. 24).
4. Goyamā ! davvatthayāe sāsae vanṇapajjavehim jāva phāsa-pajjavehim asāsae tenatthēṇam jāva siya sāsae asāsae, BhS., 14. 4. 512.

view or in short it is called paramāṇu (ultimate atom).¹ All pudgalas (forms of matter) are paramāṇus from the real or noumenal point of view, but a paramāṇu does not exist always in the form of this state. According to the intrinsic nature of combination and dissociation, an aggregate-form of paramāṇus, which is produced or manifested as a result of combination of one paramāṇu with another due to the organic process of activity or application (prayoga) of beings or with the organic process of application of beings (Vaisrasika) is called skandha (molecule). In this aggregation a group of combined paramāṇus, sometimes being subject to the law of division (bhedā-danu)² or to that of integration and disintegration (Saṅghāta-bhedebhya utpadyante)³ again can attain their respective discrete state. Paramāṇus⁴ are called Kāraṇāṇu (causative atom) from the point of view of combination and anantāṇu (ultimate discrete atom) from that of dissociation or disintegration. That is, Matter consists of two forms, viz. paramāṇu and skandha from the physical aspect of its nature. Here the point arises how do they exist in the spatial Universe. It is traikālika (of three points of time) and is subject to transformation by artificial (i. e. applied) and natural processes.⁵

Nature of Atom in the Light of the Nature of Matter

Paramāṇu is a material substance and it is attributed by the name 'dravyaparamāṇu'. It is permanent and fixed (constant) in number, for it does not give up its individuality and class, even undergoing transformation into a molecular form. It observes the law of conservation of Mass, for no paramāṇu is destroyed nor goes out of existence and no paramāṇu originates in the universe. The number of paramāṇus, which was in the past, exists at present and will exist in future. Para-

1. BhS., 20. 6. 670.

2. TS., ch. V. 27.

3. TS., ch. V. 26.

4. TS., ch. V. 27.

5. BhS., 14. 4. 510.

māṇu is non-living, because there is no essential quality of livingness in it. It possesses existentiality (i. e. quality of being) which is inferable by the mark of its effect. It is devoid of mass, for it is a unitary material substance, but it possesses a capacity to become corporeal or to assume a form of mass or corporeality by combining with other paramāṇus.¹ So paramāṇu can be called corporeal because of its capacity of assuming corporeality.

There are only four inherent properties in paramāṇu, viz. colour, smell, taste and touch, but it is devoid of shape. The shape 'āyata' (oblong) commences only from a combination of two paramāṇus having two space-points² or units. A paramāṇu is endowed with a capacity of kriyā (activity or movement); it can move from one place to another and make movements, but its movements are uncertain, i. e. accidental. It does not disintegrate nor does it break up or split up nor does it get scattered nor does it itself integrate by getting disintegrated, broken up and scattered. But it attains aggregation by combining with another paramāṇus or paramāṇu and it dissociates from that aggregation by giving up that state. A paramāṇu is not of the

1. Paramāṇuprabhṛtayo'nanṭānanta pradeśaskandhaparyava-sānāsta eva rūpavattāmananyasādhāraṇīmanekarūpa-pariṇatisāmarthyāpāditaśūkṣmasthūlavīśeṣaaprakarsā-prakarsavartinīm bibhrati, TS. Bhā. Tī., p. 325;

Matrāvadhāryate, taddhi na jātucidaticiraparicitaparamāṇudvyāṇukādikramavṛddhadravyakālapamujjhati sāmarthyācca pudgalā api na tāṁ vihāya vartante, ataḥ pudgalā eva rūpiṇa iti suṣṭhūcyate, Ibid.

2. Eṣāmiti pudgalānām paramāṇudvyāṇukādikramabhājām uktalakṣaṇām rūpām mūrtih sa vidyata iti rūpiṇah, TS. Bhā. Tī., p. 325;

Pārthivāpyataiija savāyavīyaṇavao 'pyekajātīyāḥ kadācīt kāñcīt pariṇatīm bibhrato na sarvendriyagrāhyā bhavanti, ato rūparasagandhasparaśā eva viśiṣṭapariṇāmānugṛhitāḥ santo mūrtivyapadeśabhājo bhavanti, TS., p. 324.

nature of disintegration and integration in its self-evident or discrete state, but a skandha of paramāṇus has the nature of integration and disintegration. Therefore, a paramāṇu is of the nature of integration and disintegration in its collidye or (combined) form. It is of the changing nature; it itself is changeable in state of neither heaviness nor lightness (agurulaghubhāva). This agurulaghupariṇāma (transformation of the quality of neither heaviness nor lightness) takes place in the parts of qualities—colour, taste, smell, and touch. A paramāṇu, while combining with another, can be transformed by the latter.

Paramāṇus are infinite in number.¹ In spite of the fastest speed of motion of a paramāṇu, it is not capable of going to Aloka (Non-Universe); its motion is everywhere in Loka (Universe). Therefore, a paramāṇu is called Loka-paramāṇu (co-extensive with the Universe).² As pointed out, it does come in the service of Soul in its natural state.³

According to the physical sciences, “the outstanding property that all atoms possess is that of mass. Mass is of course, an important parameter in the study of the motion of atoms by themselves as well as in the study of the motion of collections of atoms, i. e. of solid bodies and fluids. Since Avogadro’s number is large, we know that ordinary qualities of materials, contain very large number of atoms.”⁴

NATURE OF PARAMĀNU (ATOM) IN THE SĀMKHYA-YOGA PHILOSOPHY

The Sāmkhya-Yoga Philosophy admits the material existence paramāṇu (atom), but not as the unit of Matter and

1. Paramāṇu poggalā ..añamītā, BhS., 25. 4. 740.
2. Paramāṇupoggale nām logassa puracchimillām tam ceva jāva uvarillām carimantām gacchai, BhS., 16. 8. 584.
3. Ibid., 18. 4. 662.
4. Physics, pp. 299-300.

the ultimate cause of the material universe. As pointed out, paramāṇu of this system of thought is janyapadārtha (produced entity) but not an eternal entity like paramāṇus of the Nyāya-Vaiśeṣika and Jaina Metaphysics. It is evolved out of the first tanmātra (infra-atomic units of potential) which itself originates from Bhūtādi (rudiment Matter) under the operation of Rajas (Energy)¹ as a result of "the process of disintegration and emanation in the menstrum of surrounding medium of the unindividuated cosmic mass Mahat."²

A paramāṇu is the smallest portion of any substance, having the characteristic quality of it, i. e. it represents the smallest homogeneous part of any substance. It is not partless, hence it is divisible,³ for it is subject to dissociation. Here lies

1. Upaṣṭambhataḥ pariṇamayanti, Sāṃkhya Pravacanabhbāṣya, 62, ch. I, p. 35.
2. Prakhyākriyāsthitiśllānāṁ guṇānāṁ grahaṇātmakānāṁ karaṇabhbāvenaikaḥ pariṇāmaḥ śrotramindriyam grāhyātmakānāṁ śabdabhāvenaikaḥ pariṇāmaḥ śabdo viṣaya iti, śabdādīnāṁ mūrtisamānajātiyānāmekah pariṇāmaḥ pṛthiviparamāṇustanmātrāvayavah, teṣāṁ caikah pariṇāmaḥ pṛthivī gaurvṛksah parvata ityevamādih, bhūtāntaresvapi snehauṣṇyaprāṇamitvāvākāśādānānyupādāya sāmānyamekavikārārbambhah, samādhayah, Yogabhbāṣya, IV, 14, pp. 192-3; Vikaraṇabbāvah vikīrṇatāsvabhāvā vyāpitā iti yāvat, Yogavārtika on Patañjali's Sūtra Manojavittam Vikaraṇabhbāvah, etc;
Ākāśastu vikurvāṇah sparśamātrām sasarja
Balavānbhavadvāyustataḥ sparśa guṇo mataḥ
Viṣṇupurāṇa;
- See Sāṃkhya pravacanabhbāṣya, p. 35: P. S. A. H., p. 29.
3. Apakarṣaparyantam dravyam paramāṇurevaṁ,
See Yoga Sū., 52, pāda III and V Bhā., p. 174;
Loṣṭasya hi pravibhajyamānasya yasminnavayave alpatvātāratamyam vyavatisthate so' apakarṣaparyantaḥ paramāṇu,
Tattvavaiśāradī, Ibid., p. 174;

the difference between the atomicity of Matter of the Sāṃkhya-Yoga and the atomicity of Matter of the Jaina and Nyāya-Vaiśeṣika systems of thought, as the latter advocate that a paramāṇu is indivisible.

Dr. B. N. Seal explains the conception of paramāṇu in the Sāṃkhya-Yoga philosophy in this way : "In a mixed substance (militadravya, saṃhatabhūtārtha) whether it be an "isomeric" or a heterogenic compound, the quantities are due to the mixture, and therefore its paramāṇu (usually called Ārambhaka paramāṇu), the smallest homogeneous particle possessing its characteristic qualities, must result from the mixture of the paramāṇus (in smaller or larger numbers as the case may be) of the component substances. In the Sāṃkhya view, then, the paramāṇus of a mixed substance (Ārambhaka paramāṇu) corresponds to what we now call molecules."¹

According to the Sāṃkhya-Yoga Philosophy", a paramāṇu is a type of atoms corresponding to each Bhūta class, and indeed one and the same kind of paramāṇu may comprehend atoms of different masses, if only these should agree in their structural type."²

This nature of paramāṇu differs from the Jaina view of one class of paramāṇu, but it is akin to the Nyāya-Vaiśeṣika and Buddhist concepts of different classes of atoms corresponding to different elements of Matter. But the difference of views on the point lies in the fact that paramāṇus of the Sāṃkhya-Yoga are generated, whereas paramāṇus of the Nyāya-Vaiśeṣika are the ultimate causes of the material universe and the Buddhist paramāṇus are saṃghātapa-paramāṇus (combined atoms). In the Sāṃkhya-Yoga the generation of paramāṇus are conceived in the following order : "Ākāśa-atom

Nānunityatā na nirbhāgatvām, pṛthivīparamāṇuh jala-
paramāṇurūtyādīvyavahārastu pṛthivyādīnām apakarsa-
kāsthābhiprāyēnaiya, PBhā., V. 88. Vijnānabhikṣu.

1. P. S. A. H., p. 52.

2. Ibid., p. 40.

is generated by the sound-potential with accretion of rudiment—matter (Bhūtādi), the vāyu-atom is generated by the touch-potentials by combining with the vibratory particles (sound-potential); the Teja-atom is produced by the light and heat potentials by combining with touch-potential and sound-potentials; the Ap-atom is generated by the taste-potentials by combining with light and heat-potentials, touch-potentials and sound-potentials; and the Pṛthivī-atom is produced by the smell-potentials by combining with the preceding potentials. The Ākāśa-atom is endowed with the attribute of penetrability, the Vāyu-atom with impact of mechanical pressure, the Teja-atom with radiant heat-and-light, the Ap-atom with viscous attraction, and the Earth-atom with cohesive attraction.”¹

THE NYĀYA-VAIŚEṢIKA VIEW ON NATURE OF PARAMĀNU (ATOM)

As already discussed in brief outlines in the fourth chapter, paramānu (ultimate atom) is conceived by the Nyāya-Vaiśeṣika Philosophy as the ultimate particle of Matter; it is absolutely without any magnitude, its measure is anu (smallest);² it is non-spatial³ and it has no inside or outside;⁴ it is intangible to the senses; its existence is inferable by the mind or intellect.⁶ No magnitude can be produced by the adding up of its measure,

1. P. S. A. H., pp. 38-39.

2. Mahato viparītam anu, VS., VII. I. 10.

3. NV., IV, ii, 25, p. 522, line 3.

4. NS., IV. ii. 20.

5. NV., p. 233 and NVTT., p. 271, line 7 from bottom etc;
 Param vā trutēḥ, NV., IV. ii, 12;
 Trutistrasarenurityanarthāntaram, jālasūryamarīcīstham
 .trasareṇu rajah smṛtam, NV., p. 647;
 Tasya kāryam lingam, VS., IV. 1. 2; VSU., VII. ii. 9.

as it is absolutely devoid of any magnitude. It is an eternal substance.¹

According to the Nyāya-Vaiśeṣika, paramāṇus are the ultimate constituents of bodies; they are indivisible and eternal material substances. A continuous process of production is involved in their internal character, though they are themselves incapable of producing anything,² for they are kūṭa-thanitya (absolutely permanent). As there are stated to be four classes of paramāṇus corresponding to four elements of matter, viz. earth-atom, water-atom, fire-atom and air-atom, so atoms of any specific element of matter are admitted to possess all the specific qualities of it. Therefore, the four specific qualities, viz. smell, taste, colour and touch are possessed by the four kinds of atoms respectively by the order : smell by earth-atom, taste by water-atom, colour by fire-atom and touch by air-atom.⁴ The specific qualities in the atoms of water, fire and air are eternal and constant, while those in the earth-atoms are subject to transformation (chemical action) under the influence of heat.⁵ So all the atoms, except earth-atom, of the same element of matter are qualitatively similar, but they are qualitatively dissimilar from the atoms of other elements of matter. The specific qualities of the four kinds of atoms are imperceptible, for they are unmanifest and inherent in intangible non-spatial atoms in which there is no gross magnitude accruing from the combination of parts.⁶ On account of this fact atoms are

1. Anitya iti viśeṣataḥ pratiṣedhabhāvah, VS., 4. 1. 4.
2. Ibid., Sadakāraṇavannityam, Ibid., 4. 1.1; Adravyatvena nityatvamuktam, VS., II. i. 13; VV. II. 1. 13; KVbhā., p. 78.
3. NK., pp. 78-83; Avāntarabhedanirūpanārthamāha nityo cānitya ceti...kāryalakṣaṇā pṛthivī.
4. Kāraṇabhāvāt, kāryabbāvah, VS., IV. i. 3.
5. Jñānanirdeśe jñānaispattividhiruktaḥ, VS., VIII. 1. 13 and See VV.
6. Anekadravyasamavāyāt rūpaviśeṣācca rūpopatabdhih, VS., IV. 1. 8;

imperceptible, for they are not possessed of gross magnitude (mahattva) and manifested colour (udbhūtarūpa)¹ in them. But they can be perceived by the yogin with his supernatural intuitive vision which is free from the imposition of limitation of any external factors.² Paramāṇus cannot be apprehended by the tactile-sense-organ nor can they be tasted by the sense-organ of taste nor can they be apprehended by the sense-organ of smell for want of magnitude and manifested touch, taste and smell respectively in them.³ But the sense-organs come into contact with ultimate atom⁴ for the Yogen. paramāṇus are stated to be the material cause of the universe⁵ and thus inapprehensible to the sense in both collective and individual forms⁶ and they are endowed with quiddity (antyavīśeṣa) by which one is discriminated from the others⁷ The numerical

Tena rasagandhasparśesu jñānam vyākhyātam,
VS. VI. 1. 9.

1. Mahatyanekadrvayavattvāt rūpāccopalabdhīḥ, VS., 4. 1. 6;
Paramānormahattvābhāvādanupalabdhirityuktam bhavati
Vyākhyā, Ibid;
2. Dhāraṇākarṣanopapatteśca, NS., II. 1. 36;
Senāvanavad-grahaṇamitī cennātīndriyatvādaṇūnām,
NS., II. 137.
2. Indriyajamapi dvividham sarvajñiyamasarvajñyañca
sarvajñiyam yogajadharma laksāṇayā pratyāsattyā tattat-
padārtha sārthajñānam, tathā hi paramāṇavah...acintyapra-
bhāvo hi yogajadharmo na sahakāryāntaramapekṣate,
VSU., VIII. 1. 2; PPBhā., p. 97;
NV., II. 1. 35, p. 230.
3. NVTTP, VS. Fol. 26.
4. NV., IV. 1. 33.
5. Tatkāritatvādahetuḥ, NV. I. 21.
6. Sā ceyamavayavajanyā na tvanusāṁhatimātrām, etc.,
NLV, p. 8. Prakāśa on NLV., p. 122.
7. Pṛthivyādīnām navānāmapi dravyatvayogaḥ svātmānyāram-
bhakatvām guṇavattvām kāryakāranāvirodhitvam antya-
viśeṣavattvām, PPBha., p. 7.

differences of different kinds of ultimate atoms from one another and from all other things are remarkable and their differences from one another are of an ultimate nature. An ultimate atoms is differentiated from all other ultimate atoms by its ultimate differentiating characteristic called particularity (*viśeṣa*). All ultimate atoms are regarded as discrete individuals, because each of them possesses its own particularity.¹ In Jaina Metaphysics also this attribute of an ultimate atom has been discussed in the same manner by the statement “paramāṇupoggale...siya āyā siya no āyā jāva no āyā i ya,... appaṇo atthe āyā, parassa āittthe no āyā, tadubhayassa āittthe avattavām āyā i ya no āyā i ya.”²

This is to say, a paramāṇu has got self-existence or individuality from the point of view of existence and property of matter. It possesses its own independent nature different from that of another ultimate atom.

The Neo-Naiyāyikas headed by Raghunātha Śiromāṇi also hold the view that ultimate atoms and all eternal substances are distinguished from one another by themselves, for each of them is a unique particular by its very nature.³

In regard to the dimension of paramāṇu it is explained by the Nyāya-Vaiśeṣika Philosophy that a paramāṇu is endowed with the smallest and shortest dimension called pārimāṇḍalya (spherical).⁴ Jaina Metaphysics does not speak about the spherical dimension of paramāṇu, but it is clear from its statement that a paramāṇu occupies one space-point having a spherical point as its dimension, just as it is mentioned in the Nyāya-Vaiśeṣika.

1. PP. Bhā., pp. 321-22.

2. BhS., 12. 10. 469

3. Studies in Nyāya-Vaiśeṣika Metaphysics, p. 146; see PTN., pp. 30-31.

4. Kaṇādarahasya, pp. 72-73; Nitye, nityam VS., VII. 1. 19; Nityam parlmāṇḍalyam, Ibid., 20;
Pārimāṇḍalyamiti sarvāpaktṣṭam parimāṇam, NK., p. 318.

THE BUDDHIST VIEW ON NATURE OF PARAMĀNU (ATOM)

According to the Buddhist Philosophy, the finest of all rūpas (matters) is rūpa-samghātāparamānu; it is intangible to the senses and soundless and it is aṣṭadravyaka.¹ When there exists Kāyendriya (tactile sense-organ) in it, then it is navadravyaka (having nine elements); when there is aparendriya (internal sense-organ) in it, then it is daśadravyaka (consisted of ten elements). Here paramānu does not mean dravyaparamānu which is one entity and one substance, but it is samghātāparamānu sarvasūkṣmarūpasamghāta (the finest material aggregate), for there is no finer material entity than this in rūpasamghāta (material aggregation),

Saṅghabhadra maintains the view that the finest part of sapratigha rūpas (impenetrable matters) whose further division is not possible is called paramānu, i.e. a paramānu cannot be divided into any part by other rūpa (matter) and citta (mind). It is called the finest of all forms of matter, for it has no part. On this ground the name ‘sarvasūkṣma’ has been attributed to it, as the finest is called kṣaṇa and it cannot be divided into half kṣaṇa (moment).² This nature of paramānu as conceived

1. Kāme aṣṭadravyokośabdaḥ paramānuranindriyah
Kāyendriyo navadravyo daśadravyoaparendriyah
Abh. K., II, 22;
Saptadravyavinirbhāgī paramānurbahirgatāḥ
Kāmesvekādhikāḥ kāye dvyadhikaścakṣurādiṣu
Abh. D. 65. II, 100;
Paramānu (nu) samghātā (7) ityarthāḥ ta evāṣṭau
cakṣurvijñānadhātvādayo (hitvā śeṣā daśa) saṁcītā
Abh. D., p. 25.
2. D'après Saṅghabhadra (xxiii. 3. Folio 52a); Parmi les rūpas, susceptibles de resistance (sapratigha), la partie le plus subtile, qui n'est pas susceptible d'être scindée à nouveau, s'appelle paramānu, c'est à-dire le paramānu n'est pas

in the Buddhist Philosophy is similar to that of paramāṇu as explained by the Jaina, Nyāya-Vaiśeṣika and Yoga schools of thought. But it should be noted that the nature of Buddhist-Saṅghāta-paramāṇu opposes the indivisibility of atoms.¹

When in Kāmadhātu (external or physical world) sound is not generated in atom (śabdāyatana) and no indriya (sense) is produced, then this paramāṇu is aṣṭadravyaka (consisted of eight elements) as a rule, i. e. it is constituted of four particles of primary elements – earth, water, fire and air² and four particles of secondary elements, viz. colour, smell, taste and tangibility.³ When sound is not produced in paramāṇu, but it is generated by the action of other paramāṇus in kāyendriya (kāyāyatana),⁴ then one ninth substance (or entity) is produced i. e. when a sound-atom is produced by the action of other atoms, saṅghātāparamāṇu is ninefold. When sound is not

susceptible d'être devise en plusieurs par an autre rūpa, par la pensee. C'est qu'on dit être le plus petit rūpa; comme il n'a pas de parties, on lui donne nom le 'plus petit'. De même un kshana est nomme le plus petit temps et ne peut être devisé eu demikshanas (iii. 86). LVPAK II., p. 144, n. 3. Also cf "yat punarucyate rūpasamudāya iti niḥśarīraḥ paramāṇurveditavyah, vuddhyāparyantaprabhedastu paramāṇuvavasthānam piṇḍasamjñāvibhāvanatāmupādāya rūpe dravyāpariniśpattipraveśatām copādāya, As., pp. 41. 2.

1. Abh. K., i. 43. Tibetan Text, p. 83

Vide The Central Conception of Buddhism, p. 13.

2. Abh. K., i. 12 C.

3. Abh. K., i. 10 A, 250 C. D; 65 A. B.

4. The combination of these anūs which cannot be disintegrated is called saṅghātāṇu. In Kāmadhātu (external world) at least there is the co-production of eight substances and it has soundless intangible saṅghātāṇu. The substances (dravyas) are four Mahābhūtas and four upādāyārūpas (derivative matters), i. e. colour, taste, smell and touch; Abh. K. (A), p. 115.

generated in paramāṇu, but besides kāyendriya another indriya (cakṣurindriya, etc.) is produced, then there is produced one tenth substance (aparendriya) in it, i. e. cakṣurindriya, etc. are generated, because cakṣuśrotrādi-indriyas (eye, ear, etc.) are kāyendriyapratibaddhā (associated with tactile sense-organ) and pṛthakvartin āyatana (separate base). When the aforesaid saṃghātparamāṇu is associated with sound, then nava-, daśa-, and ekādaśa-dravyakas (combined atoms having nine, ten and eleven elements of particles) are produced respectively. In fact, śabdāyatana (sound) which is generated from Mahābhūtas is indriyavinirbhāgī (indistinguishable or inseparable)¹. "Strictly speaking, even an eightfold molecule (saṃghātparamāṇu) contains at least twenty atoms, since there are four sense-objects-atoms and each such derivative atom must have one atom of each of the four elements supporting it, making four derivative and sixteen elementary atoms in the simplest molecule (saṃghātparamāṇu). This number is increased to five derivative and twenty elemental atoms in the case of those molecules containing sound atoms. The number eight or nine there refers only to the different kinds of atoms in a molecule, and not to the total number or constituent atoms."² But from the stand-point of the Sarvāstivādins³ there are fourteen kinds of atoms corresponding to the fourteen elements of Rūpa (Matter), one kind for each element, i. e. one given to each of the sense organs, and one to each of the sense-objects and four additional ones for each of the Mahābhūtas.⁴

1. In one śabdparamāṇu which is produced by hands there are four Mahābhūtas, four upādāyarūpas, śabda (sound) and kāyendriya=10 dravyas ; there are 11 dravyas in śabda produced by Jihvendriya (tongue). There is the increase of Jihvendriya in it; the atoms of Jihvendriya are in the attīndriya (insensible) Jihvā (tongue)., Abh. K. (H), p. 115; Saṃghabhadra, 10, p. 383, col. 3.
2. A Manual of Buddhist Philosophy, pp, 127-8.
3. Abh. Hr. 1, etc., Vide A Manual of Buddhist Philosophy, p. 127.
4. A Manual of Buddhist Philosophy, p. 127.

A LIGHT ON CARAMA (LAST) AND ACARAMA (NOT-LAST) CONDITION OF PARAMĀNU (ATOM)

According Jaina Philosophy, paramānu is acarama (not-last) from the aspect of substance, somehow carama (last) and somehow acarama (not-last) from those of locus or field, time and condition.¹ Paramānu which, being bereft of Vivakṣitabhāva (intended condition) of transformation, will not attain that condition is carama with regard to that condition; paramānu opposite to carama is called acarama, i. e. paramānu which will attain that condition is carama with regard to that condition. Hence this paramānu is not carama but a acarama with regard to dravya (substance). for paramānu, which being lost from its own state, attains saṃghāta-paramānu (transformation of combination), and it will again attain paramānu-parināma (transformation into ultimate atom) in course of time from the state of saṃghātапariṇāma, so it is acarama. With regard to kṣetra (field) paramānu is carama in some respect and acarama in other respect. In the space where a Kevalin (omniscients) attains samudghāta (expansion of soul), paramānu which is immersed there, does never attain immersion there as being particularized by the attainment of samudghāta of that Kevalin, because of the liberation of the Kavalin that paramānu cannot come there. So it is carama in this respect. But with regard to the remaining space (non-particularized space) it will remain in that kṣetra (field or locus), i. e. it is acarama because it exists there by immersion. With regard to kāla (time) paramānu is carama in some respect and carama in other respect. In reference to kāla when samudghāta is performed by a Kevalin (omniscient), paramānu (ultimate atom) which existed, never exists at the (time) particularized by keva-

I. Davvādesenām nō carime acarime, khettādesenām siya carime siya acarime, kālādesenām siya carime siya acarime bhāvādesenām siya carime siya acarime,
Bhs., 14. 4. 512; Pañnavanā, 157.

lisamudghāta (expansion of soul by the Kevalin) because of the absence of samudghāta due to the attainment of liberation (siddhi) by the Kevalin. With regard to that it is carama, while with regard to nirviśeṣakāla (non-particularized time) that paramāṇu is acarama. With regard to bhāva it is carama in some respect and acarama in other respect, for paramāṇu which attained particular qualities like colour, etc., during the period of kevalisamudghāta, is carama in respect of that intended kevalisamudghātavīśistavarṇādipariṇāma (transformation of colour, etc. particularized by kevalisamudghāta), because of the liberation of the Kevalijñānin, again it does not attain that particular pariṇāma (transformation), while with regard to the remaining qualities, it is acarama.¹

Apradesa (partless) Condition of Paramāṇus (Atoms)

Paramāṇu is partless² with regard to dravya (substance) and also partless with regard to kṣetra (field or locus) invariably; it is partless in some respect and is having part in other respect with regard to kāla (time); it may be partless and it may have parts with regard to bhāva (condition)³ from the point of view of space-point.

A paramāṇu is partless from the aspect of kṣetra, i. e. it occupies one space-point. In its individual condition it occupies one-space point and it occupies this space-point by combining with other paramāṇu also, but it can exist there as being

1. BhS., 14. 4. 512 (Comm).
2. Paramāṇupoggale...aṇaḍḍhe, amajjhe apaese, BhS., 5. 7. 215,
Davveṇam paramāṇu khittenegappasamogādhā kāleṇega-
samaiā apaesa puggalā humti, Pudgalasaṭṭrimśikā, 2.
3. Savve poggalā sapadesāvi apadesāvi aṇaṁtā khettādese-
ṇavi evam̄ ceva kālādeseṇavi bhāvādeseṇavi evam̄ ceva, je
davvao appadese se khettao niyama apadese kālao siya
sapadese siya apadese bhāvao siya sapadese siya apadese-
je khettao apadese se davvao siya sapadese siya apadese,
kālao bhāyanāe bhāvao bhayaṇae, jahā khettao evam̄ kālao-
bhāvao, BhS., 5. 8. 221.

combined with another adjacent paramāṇu existing in another space-point. A paramāṇu combined in a skandha (molecule) also occupies one space-point, but not more than one space-point.¹

Wherever there is one paramāṇu there are not unit of Dharmāstikāya (Principle of Motion), one unit of Adharmāstikāya (Principle of Rest) and one point of Ākāśa (space). There can take place an immersion of infinite units of Jīva (soul) and Pudgala (Matter) in one space-point. The immersion of kāla (time) may occur sometimes and may not occur sometimes there. If it takes place, it is an immersion of infinite addhā-samayas² (length of time).

1. Jattha ṇāṁ Bhāṁte ! ege poggalatthikāyapaese ogādhe .. evāṁ jahā jīvatthikāyapaese taheva niravasesam,

BhS., 13. 5. 484;

See SS., 5. 10 (comm); Pudgalasatṭrimśikā, 2.

2. Jattha...ege dhammatthikāyapaese ogādhe tattha...ahamma-tthikāyapaesa .. ? ekko, ḁāgasatthikāya...? ekko jīvatthikāya ? anāmī, poggalatthikāyā...? anāmī, addhāsamayā...? siya ogādhā siya no ogādhā jai ogādhā anāmī,

BhS., 13. 5. 483.

SECOND SECTION

PROPERTIES OF ATOM (PARAMĀNU)

As to its property of colour there exists in it any one of the following five colours, viz. black, blue, red, yellow and white.¹ There cannot be more than one colour in a paramānu. This colour may be onefold up to infinitesold.² The colour of one paramānu can undergo transformation into the colour of another paramānu by combining with another paramānu or paramānus and vice versa, but its natural (intrinsic) colour is not destroyed. On the breaking up of the combination, a paramānu transforms itself into its own natural colour by dissociating from a skandha (molecule). There is no mixed colour in a paramānu.³

In regard two smell there exists in a paramānu any one of the following two smells, viz. pleasant and unpleasant.⁴ There cannot be both of them or a mixture of them in it. The capacity of smell can be onefold up to infinitefold⁵ in it. A paramānu having pleasant smell can transform into a paramānu having unpleasant smell by combination with another paramānu or paramānus and vice versa. On account of division by the breaking up of the combination a paramānu transforms itself

1. BhS., 20. 5. 668; 18. 6. 531.

2. Egaguṇakālagā नाम भाव्ये !... अग्रांतगुणकालगाः, एवां वासेसावि वाण्णगाम्द्वरासप्हासाः नेयाव्वा जावा अग्रांतगुणलुक्खति, BhS., 25. 4. 740.

3. Yadā tu sa eva pudgalaskandhalः svaparamānuvijojanena aparaparamānusamyojanena वा dravyāntaratatyamāpanno' api यावत्पूर्वपर्यायान् क्रृष्णत्वादिन्ना मुन्त्रिति तावद्भावस्थानायुरित्युच्यते, Paramāṇukhandasāstriṁśikā, p. 1; RV., 5. 25. 13, 14, pp. 491-2.

4. BhS., 20. 5. 668; 18. 6. 631; 25. 4. 740.

5. BhS., 25. 4. 740, Bhāṣṇai egaguṇāṇavi अग्रांतब्धगम्मि जाम अग्रांतगुणाः, Pudgalasat̄triṁśikā, p. 2 (5)

into its own natural smell. There does not take place the destruction of the natural smell of a paramāṇu in the state of its combination with another paramāṇu or paramāṇus.¹

With regard to taste there exists in paramāṇu any one of the following five tastes, viz. bitter, sour, astringent, acidic and sweet.² But there cannot exist in it more than one taste. The capacity of taste can be onefold up to infinitefold.³ A paramāṇu, having assumed the form of aggregation by combining with another paramāṇu or paramāṇus can undergo transformation into the taste of another paramāṇu or of paramāṇus. But its natural taste is not destroyed. On its dissociation from a skandha a paramāṇu again transforms itself into its own natural taste. There is no mixed taste in it.⁴

As to the quality of touch there exist in a paramāṇu any two unopposing touch of four touches, viz. śīta-snigdha (cold-cohesive), śīta-rūkṣa (cold-dry), usṇa-snigdha (warm-cohesive) and usṇa-rūkṣa (warm-dry).⁵ Therefore, a paramāṇu may either be (1) cold-cohesive or (2) cold-dry or (3) warm-cohesive or (4) warm-dry. There is neither heavy nor light touches in it because it is agurulaghu (neither heavy nor light) and there is neither hardness nor softness in it, for these qualities are existent in a gross molecule. Its capacity of coldness, warmth, cohesiveness and dryness is onefold up to infinitefold.⁶

GROUP OF PARAMĀṄUS (ULTIMATE ATOM) ACCORDING TO THEIR QUALITIES

From the aspect of category (*jāti*) there are many groups of paramāṇus because of variousness of *bhāva-guṇas* (condi-

1. Paramāṇukhaṇḍaśaṭṭrimśikā, p. 1.

2. BhS., 20. 5. 668; 18. 6. 630.

3. BhS., 25. 4. 740; Pudgalasāṭṭrimśikā, pp. 5-6.

4. Paramāṇukhaṇḍaśaṭṭrimśikā, pp. 1-4.

5. BhS., 20. 5. 668; RV., pp. 491-2.

6. BhS., 25. 4. 740; Pudgalasāṭṭrimśikā, pp. 5, 6.

tion-qualities). There are two hundred basic groups of paramāṇus ($5 \times 5 \times 2 \times 8$) and there are infinitefold infinite groups of paramāṇus according to the degrees of capacities of bhāvaguṇas (varṇa, gandha, rasa and sparśa=colour, smell, taste and touch).¹ As for example, one paramāṇu is black, pleasant-smelled, sweet, and warm and dry. The other paramāṇu is red, but the remaining qualities are like those of the first paramāṇu. It (first one) can become many paramāṇus having bhāvaguṇas (condition-qualities), i. e. atoms of qualities, they are of one basic group of paramāṇus. The second paramāṇu also, having bhāva-guṇas, can become many paramāṇus, hence these are paramāṇus of the second basic class. There become two hundred basic groups of paramāṇus by addition of the remaining basic groups of paramāṇus having their respective properties.

Next, the colour of the first paramāṇu is black and one-fold black, the other paramāṇu of this group is twofold black, some of this group is threefold black, some is fourfold black, thus innumerablefold black and some is infinitefold black. In this way there can be infinite subgroups of paramāṇus according to the degree of onefold up to infinitefold capacity of each bhāvaguṇa existing in each individual basic group of paramāṇu.²

CONTACT OF ATOMS

There are stated to be nine alternatives of sparśatā (contact or mere touch of paramāṇu), viz. (1) one part touched by one

1. Evarū ca sparśanādīnāmekaikasya ekadvitricatuḥ saṁ-khyeyā asamkheyānanta guṇapariṇāmo avaseyah,
RV., p. 485;

Anantabhedā api pudgalā anujātyā skandhajātyā ca dvavidhyamāpadyamānāḥ sarve gṛhyanta iti jātyādhärānanta-bhedaśaṁsūcanārthaṁ bahuvacanam kriyate, RV., p. 491.

2. BhS., 20. 5. 668; 25. 4. 740; Pudgalaṣaṭṭrimśikā, pp. 5, 6.

part, (2) more than one part touched by one part, (3) all parts touched by one part (4) one part touched by parts (more than one part), (5) parts touched by parts, (6) all parts touched by parts, (7) one part touched by all parts, (8) some parts touched by all parts and (9) all parts touched by all parts.¹

When one paramāṇu touches another one, the whole of it touches the whole of the other, for there cannot be the conception of point in point. A paramāṇu touches a skandha (molecule) having two units (pradeśas) by the alternatives—the part by the whole (parts) and the whole by the whole of it. It touches a skandha having three units by the alternatives—the part by the whole, the parts by the whole and the whole by the whole. By this order it touches also skandha (molecules) having four, five up to infinite units (pradeśas).²

In regard to the touching of the units of other substances like Dharmāstikāya, etc., it is explained that one paramāṇu touches the four points of Dharmāstikāya (Principle of Motion) in the minimum and seven points of it in the maximum.³ Similarly, it touches the four points of Adharmāstikāya

1. Paramāṇupoggale ḥaṁte ! paramāṇupoggalaṁ phusamāṇe kiṁ desenāṁ desaṁ phusai desenāṁ dese phusai 2 desenāṁ savvaṁ phusai 3 desehim desaṁ phusai 4 desehim dese phusai 5 desehim savvaṁ phusai 6 savvenāṁ desaṁ phusai 7 savvenāṁ dese phusai 8 savvenāṁ savvaṁ phusai 9, BhS., 5. 7. 216.
2. Evam paramāṇupoggale dupadesiyam phusamāṇe sattamaṇavamehim phusai, paramāṇupoggale tipaesiyam phusamāṇe nippacchimaehim tihim phu jaḥā paramāṇupoggale tipaesiyam phusāvīo evam phusāveyavvo jāva ānaṁtapaesaio, BhS., 5. 7. 216.
3. Ege Bhamte poggalatthikāyapaese kevaiehim dhammatthikāyapaesehim ? evam jaheva jīvatthikāyassa, BhS., 13. 4. 482;
Ege ! Bhamte jīvatthikāyapaese kevaiehim dhammatthikāyapucchā jahannapae cauhim ukkosapae sattahim,
Evam ahammatthikāyapaesihiṁ vi, BhS., 13. 4. 482.

(Principle of Rest) in the minimum and seven points of it in the maximum. That is to say, the point of space in which one ultimate atom exists is one and the same point of Dharmāstikāya and of Adharmāstikāya also. There can be six points of Dharmāstikāya on the six sides of a paramāṇu—east, west, north, south, up and down. Therefore, one paramāṇu can touch seven points of Dharmāstikāya at the maximum. But in the corner of Loka (universe) there can be the three points of Dharmāstikāya on the three sides of a paramāṇu. For this reason it is stated that one paramāṇu can touch the four points of Dharmāstikāya at the minimum. One paramāṇu touches the point of Dharmāstikāya immersed in one point of space with it (atom) by the rule of “the whole is touched by the whole.” The same explanation of this process of touch is to be understood in the case of Adharmāstikāya. But it is not comprehensible by this order of division whether a paramāṇu touches the parts of Dharmāstikāya or of Adharmāstikāya in six directions of its own sides. There is no intervening space between one space-point and another. For this reason the contact which takes place between two points existing in close proximity should be accepted in the case of paramāṇu with the unit of Dharmāstikāya existing in close proximity. It is futile to conceive of a part in a partless ultimate atom. A paramāṇu pudgala touches the seven points of Ākāśastikāya (space)¹ at the minimum and maximum respectively because Ākāśastikāya is everywhere (all-pervading).² It touches the infinite points of Jīvāstikāya (Soul), for the infinite points of Soul can immerse in one space-point.³ If a paramāṇu touches Addhāsamaya

1. Kevaiehim āgāsatthikāya ! sattahim kevaiehim jīvatthikāya ? sesam jahā dhammatthikāyassa anaṁtehim kevaiehim poggalatthikāyapaesehim putṭhe ? Goyamā ! anaṁtehim, BhS., 13. 4. 482.
2. Āgāsatthikāyassa sayyattha ukkosagam bhāniyavvam, Ibid.
3. Kevaiehim jīvatthikāyapaesehim putṭhe Goyamā ! anaṁtehim, Ibid.

(time), it touches infinite times¹ (addhāsamayas). These characteristics of paramāṇu show its extensiveness with the Universe and its all-pervasiveness.

VIBRATION AND MOTION OF ATOM

Pudgalagati (Motion of Matter) is defined as that which causes the motion of paramāṇupudgalas up to that of ananta-pradeśikaskandhas (molecules having infinite units of matter)². Paramāṇu is active and dynamic, but it is not always active or moving; sometimes it is active, sometimes it is non-active.³ Its activity is accidental.⁴ There are stated to be many kinds of movement of paramāṇu. It sometimes vibrates (revolves), sometimes makes various vibrations up to undergoes transformation.⁵ It is evidently clear by the Jaina Āgamic statement 'siya eyati siya veyati jāva pariṇamati' that besides vibration and various vibrations, a paramāṇu makes also other movements.

1. Kevaiehiṁ addhāsamaehiṁ puṭṭhe siya puṭṭhe siya no puṭṭhe, jai puṭṭhe niyamam aṇamtehiṁ. Ibid.
2. Se kiṁ tam poggalagati ? jaṁ ḥam paramāṇupoggalāṇam jāva aṇamtapaesiyāṇam khamdhāṇam gai pavattai, se tam poggalagai, Pañnavanā, 16. 474.
3. Paramāṇupoggale ḥam Bhamte ! eyai veyai jāva tam tam bhāvam pariṇamai ? Goyamā ! siya eyai veyai jāva pariṇamai siya no eyai jāva no pariṇamai, BhS., 5. 7. 213; Navaram ṣaṣṭham, tatra ṣaṣṭho deśayoh ejanam, pradeśayo-reva vā anejanamiti, BhS., 5. 7. 213 (comm);
Paramāṇu...ityādi siya eyati tti kadācit ejate, kadācitkatvāt sarvapudgaleṣu ejanādīdharmāṇam, dvipradeśika trayo vikalpaḥ (1) syād ejanam, (2) syād anejanam, etc. (comm).
4. Ibid. It shows that the motion of an ultimate atom is relative, it is sometimes stable and sometimes unstable like the nuclei of the physical sciences.
5. BhS., 5. 7. 213.

That is to say, paramāṇus are always in a state of flux by their vibrating (revolving), moving, combining with one another to transform themselves into skandhas. Hence it is explained that a paramāṇu may or may not vibrate and transform itself into a state of vibration.¹

A paramāṇu can make deśāntaragāmīkriyā (activity or movement of going to another place) from one space-point to another one. While making vibrating movement, it can make also deśāntaragāmī movement. The motion can take place together with other movements like vibration,² etc. Here the question arises how does a paramāṇu existing in one space point make vibration. In the usual sense the meaning of the word 'eyai' is vibration, but it is not desirable here, for in that case there takes place the movement of a paramāṇu from one space-point beyond it. Therefore, a paramāṇu existing in one space-point can only make a revolving movement, but the revolution should be without any axis, because there cannot be the conception of an axis is a paramāṇu. It is itself axis.

The movements of a paramāṇu such as, vibration, etc., can be samita (regular) and aniyamita (irregular) also, i. e. certain and uncertain. Here niyamitatā (regularity) or aniyamitatā (irregularity) of the movement of a paramāṇu is conditional upon space-time.³

In a paramāṇu activity or motion can be natural (spontaneous) or it can be made by the combination of other paramāṇu or skandha. The activity and motion which take place in Matter due to the instrumentality of Jīva (Soul or being) are called applied (prāyogika) activity and motion. But there cannot occur any activity and motion in a paramāṇu by the instrumentality of Jīva (soul) because a paramāṇu cannot be

1. BhS., 5. 7. 213.

2. BhS., (comm.), 3. 3. 153.

3. Eṣāṁ ca ejanādibhāvānāṁ kramabhāvitvena sāmānyatāḥ sadeti mantavyam na tu pratyekāpeksayā kramabhāvināṁ yugapadabhāvāditi, BhS., (comm.), 3. 3. 153.

received by Jīva and there is no capacity in Jīva to bring about a transformation in Pudgala without receiving it.¹ Therefore, the activity and motion which take place in a paramāṇu are natural.

SPEED OF MOTION OF PARAMĀNU

It is stated in the Jaina Āgamas about the deśāntaragāminikriyā=yāni-gatikriyā (movement) that a paramāṇu can go from the eastern last border of the Universe to the western last border, from the western last border to the eastern last border, from the northern last border to the southern last border, from the southern last border to the northern last border, from the upward last border to the downward last border and vice versa in one samaya (instant) by its maximum speed of motion.² Its minimum speed of motion is determined

1. BhS., 16. 8. 585;

In Aloka there is the non-existence of matter and media of motion and rest, hence soul cannot make movement there, BhS., 3. 2. 147; 5. 8. 221; 6. 3. 244;

Jīvāṇam kammovacae...payogasā jīvāṇam tivihe pagoe pannatte, tamjähā-maṇappaoge, vai. kā iccenām tivihenām paogenām jīvāṇam kammovacae payogasā no vīsasā, BhS., 6. 3. 234;

Deve nām Bhamte ! mahiddhie jāva mahānubhāge bahirae poggale apariyāitte pabhu egavaṇṇam egarūvam viuvvitiae, Goyamā ! no iṇatthe, BhS., 6. 9. 253;

Deve nām Bhamte ! mahiddhie jāva mahesakkhe bābirae poggale apariyāittā pabhu tiriypavvayam vā tiriyahittim vā ullamghettae vā pallamghettae vā ? Goyamā ! no iṇatthe samattbe, Ibid., 14. 5. 517;

Jīvadavvāṇam ajīvadavvā paribhogattāe havvamāgacchānti, Ibid., 25. 2. 72.

2. Paramāṇupoggale nām Bhamte ! logassa puracchimillāo carimamtāo paccacchimillām carimamtam jāva uvarillām carimamtām gacchai, BhS., 16. 8. 584; Paṇṇa., 16. 471.

by its going from one space-point to another adjacent space-point by slow movement¹ in one samaya (instant). That means samaya is divisible. Here is a defect in the conception of the last unit of kāla (time) as conceived in Jaina Philosophy.

The motion of paramāṇupudgala takes place in a straight line. In one unit of Kāla its motion, whether from one space-point to another one or from one last border of the Universe to another one, is to occur in a straight line.² If it is curvilinear motion, then it will take more than one samaya. Vigraha-gati (curvilinear motion) occurs due to the action of others.³

SPRṢTAGATI (MOTION) OF ATOM BY TOUCHING OTHER MATTERS

When a paramāṇu (ultimate atom) makes a movement by touching skandhas (aggregates) having from two up to infinite units of matter, it is called sprṣṭa-or sparśagati.⁴

When the division of a skandha takes place, then a motion is the splitted up pieces of matter is produced. But there can be motion also in the unbroken or unsplitted up pieces of matter due to ten causes, viz. motion while collecting, transforming, breathing in, breathing out, feeling, dissociating (karmic matter), assuming transformable body, enjoying sexual pleasure, being overpowered or overtaken by Yakṣa (ghost or spirit) and being carried by air.⁵ There takes place a motion

1. Pravacanasāra, Vṛtti, II. 46.

2. BhS., 16. 8. 584; TS. Bhā., 2. 27.

3. Ibid.

4. Phusamāṇagai jannam paramāṇupoggale dupaesiya jāva
anāṁtapaesiyānam khamdhānam anāmaṇnam .. phusittā
nam gai pavattai... settam phusamāṇagai, Pañña., 16. 474.

5. Dasahim thānehim acchinne puggale calejjā, tamjähā-āhā-
rijjamāne vā calejjā, parināmejjamāne vā calejjā, ussasijja-
māne vā calejjā, nissasijjamāne vā calejjā, vedejjamāne vā

in Matter, because of there being the division of breaking up of skandha. When a paramāṇu dissociates from one skandha it does so by a terrible motion. On the disintegration of a skandha a dynamic motion is naturally generated, but in acchinna pudgala-skandha (unbroken aggregate of matter) also there takes place a dynamic motion due to the above mentioned ten causes.

Activity and motion of paramāṇu are regular from some point of view and irregular also from other points of view. But they are mainly irregular, for this reason the motion of it is called aniyata (irregular).¹

Paramāṇus are vibrating (or moving) and non-vibrating (or non-moving) from the point of view of time.² The duration of vibration (or movement) of a paramāṇu is one samaya (instant) in the minimum and innumerableth part of an āvalikā in the maximum and that of its non-moving is one samaya in the minimum and innumerable samayas in the maximum.³ A paramāṇu is sarvajja and nireja (wholly moving and non-moving), while skandhas (aggregates) having two up to infinite units may be deśaija (partially moving), sarvajja (wholly moving) and nireja (non-moving).⁴

In regard to the intermediate times of the vibration of matters—ultimate atoms and aggregates, it is stated that matter immersed in one space-point or innumerable points of space exist vibrating for one samaya in the minimum and innumerableth part of an āvalikā in the maximum in the case

calejjā, nijjarijjamāṇe vā calejjā, viuvvijjamāṇe vā calejjā,
pariyārijjamāṇe vā calejjā, jakkhaithe vā calejjā, vāyapa-
riggahe vā calejjā, Sthānā., 10. 9. 35.

1. RV., 2. 26; Paramāṇorgatiḥ aniyata, vide Jaina Padārtha Vijñānamen Pudgala, p. 72.
- 1, BhS., 25. 4. 744;
2. Ibid., 5. 7. 217.
4. Ibid., 25. 4. 744

of vibration and innumerable samayas in the case of non-vibration from the points of view of time, etc.¹

As to the rules of irregular and regular activity and motion of paramāṇu the following points emerge out of the discussion on the activity and motion of it : (1) It is uncertain when an non-active ultimate atom will commence its activity and motion. They may start at any time between one samaya (instant) and countless samayas (instants). But after the passing away of countless samayas it will definitely commence its activity and motion. (2) It is not possible to say when an active ultimate atom will stop its activity and motion. It can stop them at any time between one samaya and the innumerable part of an āvalikā. But after an innumerable part of an āvalikā it will definitely stop its activity and motion. (3) It is uncertain to presume what direction will be taken by a paramāṇu in its deśāntaragati (cross space-point-movement). On the commencement of its motion spontaneously, it may make movement in any direction. But it is not yet determined which direction will be taken by it in its movement, if it is made by the action of other pieces of matter. (4) Besides, it cannot be said what kind of motion and activity it will make on their commencement. It is uncertain whether it will revolve or vibrate and move simultaneously on its course to reach another place. (5) It is not possible to say what speed—slow or fast, will be taken by a paramāṇu in its commencement of its motion and activity. It is uncertain whether it will take the speed of motion of traversing one space-point in one samaya (instant) or the speed of motion for reaching the last border Loka (Universe) in a samaya (instant) or any intermediate speed of motion between them.

But the following rules of regular motion of a paramāṇu can be outlined in this way : (1) The deśāntaragati (movement from one place to another) of a paramāṇu will take place in a straight line. (2) In the case of its curvilinear motion an

1. BhS., 5. 7. 217.

application of another matter is necessary. (3) Soul cannot be the direct cause in its movement. (4) The minimum speed of motion of a paramāṇu is the traversing of a distance of one space-point in one samaya, while the maximum speed of its motion is determined by its movement from one last border of the Universe to another last border in one samaya. (5) The motion and activity of a paramāṇu take place spontaneously and they can be effected by the application of other matters.

PRATIGHĀTA OF PUDGALA (RESISTANCE OF MATTER)

There are stated to be three kinds of pudgalapratighāta (resistance of matter), viz. (1) resistance obtained by one paramāṇu of skandha (molecule) when it is resisted by another paramāṇu on the way of its motion, (2) resistance obtained by a paramāṇu due to its property of dryness (repulsive force) and (3) resistance obtained by a paramāṇu at the last border of the Universe because of the non-existence of Dharmāstikāya (Principle of Motion) in the Non-Universe.¹ In other words, the resistance obtained by an ultimate atom is possible under three conditions : (1) If there takes place the physical contact of an ultimate atom with another one, while making their motion in great speed by the process of natural transformation, then the first paramāṇu is resisted in itself and can resists the other paramāṇu with which it comes into contact. (2) Having combined with other paramāṇu or skandha by virtue of its property of cohesiveness and dryness, a paramāṇu loses its individuality (or discreteness) for a certain period of time. (3) It is resisted in its motion at the last border of the Universe because of the absence of Dharmāstikāya (Principle of Motion)

1. Tivihe poggalapadīghātē, pa tam paramāṇupoggale paramāṇupoggalam pappa padīhanijjā, lukkhattā vā padīhanijjā, logamte vā padīhanijjā, Sthānāṅga, 3. 211, 3. 4. 211.

in Aloka (Non-Universe). Thus according to three kinds of resistance, three names have been attributed to the resistance obtained by a paramāṇu, viz. vega-pratighāṭa, bandha-parināma-pratighāṭa and upakārābhava-pratighāṭa.¹

A paramāṇu is resisted by another one on the way of its motion because of their respective properties of impassability or impenetrability, when they come into contact with each other in their motion. A paramāṇu bound by combination with another one or other paramāṇus exists collectively with other paramāṇus in a skandha (aggregate). In this way it is resisted by its own individual condition. This resistance of a paramāṇu is the cause of the perceptible multifariousness of the Universe. According to the physical sciences also, these interactions give rise to "the existence and behaviour of matter in bulk."² In the movement of an ultimate atom Dharmāstikāya (Principle of Motion) is assistant on account of its support in the motion, so it is to take the support of Dharmāstikāya in its activity and motion. It cannot make any activity and motion without this support in spite of its having the capacity of making motion and activity.

Dharmāstikāya is co-existentive with the space of the Universe, but it does not exist in the Non-Universe. A paramāṇu cannot go there because of being inactive and immobile in the absence of Dharmāstikāya. Therefore, it is resisted and stopped at the last border of the Universe, when it reaches there by making motion in great speed in one samaya.

The following rules of Pratighāṭatva and Apratighāṭatva (resistance and non-resistance) emerge out of the discussion on the speed and resistance of paramāṇu. If any moving ultimate atom does not meet another moving ultimate atom in its way of motion with any speed, then it cannot be resisted. In this-

1. Yatastrividham pratighāṭamāmananti bhagavantah, paramāṇūnām bandha-parināmopakārābhāvavegākhyam,
TS., p. 368.
2. Atoms and the Universe, p. 126.

way the occurrence of mutually opposing conditions resisting and non-resisting (pratighātin and apratighātin) in an ultimate atom has been accepted in Jaina Metaphysics. In the physical sciences also the existence of such mutually opposing conditions—resisting and non-resisting, in matter is explained by demonstration. As for instance, X-Ray is non-resisting in comparison with any gross matter of different kinds; it does not stop on its way, but it is resisted by the thick covering of glass.

APRATIGHĀTA (NON-RESISTANCE) OF ATOM

A paramāṇu (ultimate atom) is non-resisting in its motion; nothing can resist, obstruct and stop it in its motion in the Universe except the above mentioned three conditions. Hence it is not resisted in its movement to another place; it is capable to exist together there where many other ultimate atoms exist; it is capable to make activity independently of those of others; it is able to move from there without any resistance, while existing together with other ultimate atoms. As these four natures exist in an ultimate atom, so it is non-resisting. A moving ultimate atom cannot be resisted by any other matter, any being and any other substance in this way. It goes off from the midst of all by making movement. It accommodates itself in the space-point in which other matters or soul or other substances exist, having gone there. It can make activities like revolution, vibration, etc., by its independent state, while accommodating itself with others. An ultimate atom is non-resisting in itself and non-resisting also to another material substances from this view-point, i. e. it does not resist others. Thus it is fully independent in this respect.

THE NYĀYA-VAIŚEṢIKA VIEW ON MOTION OF PARAMĀNU (ATOM)

According to the Nyāya-Vaiśeṣika, there is supposed to be two kinds of motion of free atoms, viz. creative motion and

non-creative motion. The creative motion produces conjunction of ultimate atoms, which leads to the formation of gross bodies and eventually of the material universe. This motion is generated in ultimate atoms only on the eve of a new cosmic creation after the period of cosmic rest (pralaya).¹ The non-creative motion is not productive of conjunction or disjunction of ultimate atoms. It simply separates ultimate atoms from the space-points occupied by them and join (i. e. combine) them with the contiguous point of space. It may occasionally cause a kind of placing of atoms side by side or loose grouping of atoms, but it never conjoins them to be actually integrated nor to be composite bodies.²

No impact upon the process of creation is made by this motion; it is possible for atoms only during the period of cosmic rest. It is supplanted by the creative motion of the emergence of the necessity for creation. The only object of non-creative motion is to determine the duration of cosmic rest in terms of *kṣana* resolved by each unit of such motion.³

There is no spontaneous motion of free atoms in these two cases, for *Adṛṣṭa* (unseen force) is supposed to be the cause of creative motion. It leads the destiny of souls in accordance with their karmas and demands to be furnished with properly equipped bodies and suitable material world for the experience of pleasure and pain. Under the operation of this force atoms begin to move in order to combine into countless varieties of objects. The non-creative motion is produced in this way, when a body is dissolved by a violent shaking or impact, the effect of which sets the atoms of the dissolved body in motion. The motion generates in atoms in turn the property of impulse (*vega*) which keep them going, i. e. vibrating (*spandana*) continually during the whole period of cosmic rest.⁴

1. Studies in Nyāya-Vaiśeṣika Metaphysics, p. 146.

2. Ibid., p. 147; see NKuB., p. 91.

3. Ibid., see NKu, Pt. I, p. 333.

4. NKuB., p. 91, vide Studies in Nyāya-Vaiśeṣika Metaphysics, p. 147.

The fundamental difference between the Jaina and Nyāya-Vaiśeṣika systems of thought in regard to the motion of atom is this that the former maintains that the motion is the intrinsic capacity in an ultimate atom, while the latter holds the view that the motion is not inherent in an ultimate atom but it is caused by *Adṛṣṭa* (unseen force) in the case of creative motion and it is generated by the effect of violent shaking of a body or impact in the case of non-creative motion. The Jaina view on oscillation and motion of paramāṇu (ultimate atom) is nearer to the atomic motion of the physical sciences.

As for example, "From X-Ray studies it is known that in crystalline solids the atoms are located at definite points in a lattice arrangement. The atoms vibrate about these lattice points, the amplitude of the vibration increasing with the rise in temperature. At the melting point, which occurs at a fixed temperature different for each crystalline substance, the amplitudes of the vibrations have become as large as to disturb the orderly arrangement of the atoms."¹

"The concept of oscillatory behaviour, or wave motion is a basic one which finds wide application in atomic physics."² "The wave aspect of elementary particles is possibly their most fundamental characteristic, and it is not possible to reduce this concept further by forming any adequate picture of what substance, if any, is undergoing pulsation."³

"The motion of atom of the physical sciences is demonstrated by the breaking up of atom, its smashing by the energy within itself and the emission of energy from it and the radiations from the radio active elements which consist of three distinct types— α -, β - and γ -rays. Radio active substances emit spontaneously either helium nuclei or electrons. These take place the radio active transformation in them. "When a nucleus is transformed into another, either by α - or β -decay, some

1. Physics, p. 261.

2. Atomic Physics, p. 12, 1, 4.

3. Ibid.

energy is released in the process, which is taken up as the energy of motion of the α—or the β—particle with surplus appearing as γ-rays. The energy released from the nucleus may be quite high of the order of millions of electron-volts.”¹

As to vega-pratighāta of paramāṇu conceived in Jaina Philosophy it can be said that the physical sciences contain a parallel view in regard to the collision of atomic particles. “In any elastic collision, say between two billiards balls, the total energy and the total momentum before and after the collision must be the same. If one ball makes a head-on collision with another at rest, the first will come to a stop and the second will carry on in the forward direction with the energy and momentum previously had by the first particles. In off-centre collisions both balls will be set into motion at right angles to each other, and the direction and energy of each of the balls can be simply calculated from the conservation of laws. Similarly, if atomic particle collides with a helium nucleus, both are set in motion at right angles to each other. We can often observe the path of both particles after collision in a cloud chamber and verify that the laws of conservation of energy and momentum hold for nucleus processes.”² “Neutrons themselves are last detected by making them collide with protons, i. e. by letting the neutron beam pass through a hydrogeneous medium, say water or paraffin wax. Since the neutron and the proton have approximately the same mass, their collision is analogous to that between two billiards balls. In a head-on collision the neutron is brought to rest and the proton is emitted in the forward direction with the whole energy. In off-centre collisions the proton may be emitted at different angles but from the angle of emission and from the energy of the proton the energy of the neutron can be deduced.”³

In regard to Bandha-parināma-pratighāta of paramāṇu a

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1. Atomic Physics, p. 65.
 2. Atoms and the Universe, p. 84.
 3. Ibid., p. 87.

similar theory is found in the physical sciences, "Every atom exerts a force upon every other atom. The details and the magnitude of the force vary as between one type of atom and another, but in general the force is always a force of attraction when the atoms are at a distance apart greater than their normal diameters, changing to a force of repulsion if the atoms are forced very close together. Thus there will be a tendency for atoms because of their force of attraction to draw together and stick."¹

The Jaina view of *upakārbhāva-pratighāta* of paramāṇu compares well with the view of modern science that beyond the borders of the finite universe even the light rays do not travel, as nothing lies beyond, probably nothing manifested; "light rays, apparently going in a circle, returning boomerang-like to their point of departure."² That is to say, they are resisted or checked like paramāṇus of Jaina philosophy at the last border of Loka (Universe) because of the absence of the support of motion.

1. Atoms and the Universe, p. 126.
2. Mysteries of Space, p. 5.

NINTH CHAPTER

TRANSFORMATION OF MATTER (PUDGALA-PARIṄĀMA)

Matter (Pudgala) undergoes transformation ; there takes place the external and internal transformations in its attributes. The change in the character of the qualities of a substance is pariṄāma (transformation)¹ which is brought about by the applied process or the natural process without giving up its own class or nature.² Generally an attainment of another state by giving up one state is called pariṄāma. No substance is absolutely permanent by any means nor is it destroyable by all means, for this reason, it is proper to admit pariṄāma of each substance.³ From this point of view it is beginningless and is having a beginning also.⁴ As for instance, pariṄāma of Matter is ādimat (having a beginning);⁵ an ultimate atom undergoes two kinds of pariṄāma, viz. gatipariṄāma (transformation of motion) and guṇapariṄāma (transformation of quality). An ultimate atom having equal guṇa will transform another ultimate atom having equal but dissimilar guṇa because of its combination with another ultimate atom or molecule. An ultimate atom having higher degrees of guṇas (qualities)

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1. PariṄāmo avasthāntaragamanam na ca sarvathā hyavasthānam, na ca sarvathā vināśah pariṄāmastađvidabhiṣṭah, vide Syādvādmañjarī, p. 205.
 2. Dravyasya svajātyaparityāgena prayogavistasālakṣaṇo vikāraḥ pariṄāmaḥ RV., 5. 22. 10.
 3. PariṄāmo avasthāntaragamanam na ca sarvathā hyavasthānam na ca sarvathā vināśah pariṄāmastađvidabhiṣṭah, Syādvādmañjarī, p. 205.
 4. Anādirādimāṁśca, TS., ch. V. 43.
 5. Rūpiśvādimān, TS., ch. V. 43.

will transform an ultimate atom having lower ones.¹ It is explained in the Tattvārthādhigama Sūtra that some skandha (molecule) is formed by the process of combination of ultimate atoms, some by that of dissociation of molecules and some by both the processes of combination and dissociation of ultimate atoms² or molecules. When one binary molecule is formed by combination of two discrete ultimate atoms, then it is called dvipradeśika skandha produced by combination of two ultimate atoms. Similarly, tripradeśika skandha (molecule having three units of matter), catuspradeśika skandha (molecule having four units of matter), saṃkhyātapradeśika skandha (molecule having countable units), asaṃkhyātapradeśika (molecule having countless unils), anantapradeśikaskandha (molecule having infinite units) up to anantānāntapradeśikaskandha (molecule having infinitefold infinite units) are formed by combination of three, four, countable, countless, infinite and infinitefold-infinite ultimate atoms,³ respectively.

The smaller and smaller skandhas which are formed by the process of disintegration of larger skandhas can be found as anantānāntapradeśikaskandha up to dvipradeśikaskandha⁴ (molecule having two units)

When, on the disintegration of any skandha a new skandha is formed by the process of combination of some other material substance with the part of that skandha at the very moment, then that skandha is stated to be formed by the joint process of

1. Bandhe samādhikau pariṇāmikau, TS., ch. V. 36.
2. Saṅghātādbhedāt saṅghātabhedāditebhyastribhyaḥ kāraṇebhyaḥ skandhā utpadyante dvipradeśādyah, TS., Bhā., 5. 26, p. 366.
3. Tadyathā-dvayoh paramāṇvoḥ saṅghātāt dvipradeśah, dvipradeśasyāṇośca saṅghātāttripradeśah, egaṁ saṃkhyeyānāmasaṃkhyeyānām ca pradeśānām saṅghātāt tāvatpradeśah, TS., Bhā., p. 367.
4. Eṣāmeva bhedād-dvipradeśaparyantah. TS. Bhā., 5. 26, p. 370.

combination and dissociation of parts of skandha. Such skandhas also can be dvipradeśikaskandha up to anantānanta-pradeśikaskandha.¹ It should be understood for skandhas having more than two units that skandhas having three units, four units, etc., are formed by combination of three, four, etc.—discrete ultimate atoms also. And tripradeśikaskandha can be produced by combination of an ultimate atom with dvipradeśikaskandha and catuṣpradeśikaskandha by combination of two or one ultimate atom with dvipradeśika or tripradeśikaskandha respectively by the gradual order.²

An ultimate atom is not an effect of any material substance, for this reason the combination of material substance is not possible in its origination. It has been accepted as eternal; nevertheless, here its origination which is spoken of in the sūtra, "Bhedādanuh" is explained from the point of view of paryāya (mode), i. e. an ultimate atom is eternal as substance, but it is also producible (janya) from the modal point of view. The states of its existence sometimes as a constituent element of a skandha and sometimes as a discrete atom, because of being dissociated from a skandha are its paryāyas (modes or particular conditions). The discrete state of it (viśakalita avasthā) originates by disintegration of a skandha for this reason, here the purport of the statement "origination of ultimate atom by a process of disintegration" is this much that an ultimate atom having the discrete state is an effect of the disintegration of a skandha, but not a pure ultimate atom.³

It is further explained that imperceptible skandhas having

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1. Eta eva ca saṅghātabhedābhyaṁ mekasāmayikābhyaṁ dvipradeśādayah skandhā utpadyante, anyasaṅghātenānyato bhedeneti, Ibid.
 2. TS., p. 370.
 3. Bhedādeva paramāṇurutpadyate, na saṅghātāditi, TS. Bhā., p. 371;
see also the Commentary of Siddhasena Gaṇin, TS., p. 371.

an efficient cause can be perceptible.¹ There are different kinds of transformation of Matter; therefore some skandha is inapprehensible to the sense of vision, while some is apprehensible to the sense of vision. A skandha which is imperceptible because of being fine, can be perceptible by its gross transformation, having given up the state of its fineness or fine transformation.

In such a formation of that skandha both the causes—disintegration and integration are conditions. When on the cessation of sūksmatvapariṇāma transformation of fineness in any skandha there originates sthūlatva-pariṇāma (transformation of grossness) then some new ultimate atoms must necessarily combine with that skandha, but some ultimate atoms dissociate also from it. On the cessation of sūksmatvapariṇāma an origination of sthūlatva-pariṇāma takes place not merely by combination of combined ultimate atoms or only by dissociation of dissociated ultimate atoms. Without sthūlatvapariṇāma no skandha can become perceptible. For this reason, here as a rule it is said that a perceptible molecule is formed by both the process of disintegration and integration.²

1. Bhedasaṅghātābhyaṁ cākṣusāḥ, TS., 5. 28, p. 372;
Bhedasaṅghātābhyaṁ cākṣusāḥ skandhāḥ utpadyante
acākṣusāstu yathoktā saṅghātād-bhedāt saṅghātabhedācceti,
TS. Bhā., 5. 28, p. 372.
2. Svata eva pariṇativiśeṣācākṣusāt vapaṇipāmabhājō bādarāḥ
skandhāḥ saṅghātabhedābhyaṁ utpadyante ityetanniya-
mayate apare varṇayanti saṅghātādeva skandhānāmātmalā-
bhāsiddherbheda saṅghātagrahaṇamanartha kām, naitadevām
tadviśeṣajñāpanārthavat, na sarva eva saṅghātaścakṣuṣā
grāhyāḥ, yato anantānantāṇusāṁhatinispādyo' api skandho
bādarapariṇatimānevanayanādigocaratām pratipadyate, na
śesa iti evām ca vyācakṣāṇānām bhedagrahaṇamanartha-
kameva syāt taccāyuktām, yataḥ sūksmapariṇāmo paratau
sthāulyapariṇāmāḥ, tatra ca yathā saṁhanyate paramāṇava-
stathā bhidyante api kecanetyataḥ saṅghātabhedābhyaṁ-
va cākṣusā niśpadyante na saṅghātādeveti, TS., p. 372.

Two meaning of the word 'Bheda' are implied : (1) disintegration of skandha, i. e. a dissociation of ultimate atoms from it and (2) on the cessation of the previous transformation an origination of another transformation. The purport of the above sūtra¹ has been taken up by accepting the first one between them. According to the second meaning, when any fine molecule attains a gross transformation capable to be apprehended by the sense of sight, i. e. on the cessation of imperceptibility, it becomes apprehensible to the sense of sight,² then a gross transformation (bādarapariṇāma) is a condition in its becoming as such, which is conditional upon the combination of particular number of infinite discrete ultimate atoms (saṃghāta). Not only the new gross transformation on the cessation of the former transformation-like fineness is the cause of its becoming perceptible nor only particular infinite number of ultimate atoms is the cause of its becoming perceptible, but both the transformation and the said number-like combination are the causes of its becoming perceptible. Although the meaning of the word 'Cākṣusā' of the aphorism "Bhedasaṅghātābhyaṁ cākṣusāḥ", denoting a skaadha apprehended by the eye, appears to be correct; nevertheless, here the characteristic meaning of all the sense-organs are implied by the word 'cākṣusā'. According to this interpretation, the meaning of the sūtra is that dissociation and combination—the two causes are the conditions in the becoming of all intangible skandhas to be tangible to the senses. On account of there being unlimited varieties of material transformation, as the previously intangible skandha can be later tangible to the senses due to the causes like disintegration and integration, so a gross skandha also becomes fine. Not only this much, for a skandha apprehended by more senses becomes apprehensible to a few senses due to the

1. Bhedasaṅghātābhyaṁ cākṣusāḥ, TS. V. 28.

2. Ubhābhyaṁ bhedasaṅghātābhyaṁekakālābhyaṁ cākṣusā bhavanti, cākṣurgrahaṇācca samastendriyaparigrahaḥ, TS., p. 373.

varieties of transformation, e. g. the things like salt, resinous substance, etc., can be apprehended by the four senses, viz. the senses of sight, of touch, of taste and of smell, but they can also be apprehended by only the senses of taste and smell because of its being diluted into water.¹

As to the point of the cause of the origination of intangible skandha (molecule) it is explained that the three causes of the origination of skandha have been discussed in general way in the twenty-sixth aphorism "Saṅghātabhedebhya utpadyante"—here only the particular discussion is made on the causes of becoming of particular skandha or of the origination of a perceptible skandha from its imperceptible state. For this reason, according to that general rule, the causes of the origination of acākṣuṣa skandha (imperceptible molecule) are only three, viz. bheda, saṅghāta and bhedasaṅghāta (disintegration, integration and disintegration-integration).

KINDS OF PUDGALAPARIṄĀMA (TRANS-FORMATION OF MATTER)

There are mainly ten kinds of paramāṇus² taking place in Matter, viz. varṇapariጀāma (transformation of

1. Ta eva bādarāsta eva ca punaḥ sūkṣmā iti, yato vicitrapariጀāḥ pudgalāḥ kadācid-bādarapariጀāmamanubhūya jala-dharasātakratucāpasaudāminilavaṇasakalādikamatha paścādalakṣaṇīyapariጀāmamātmasvarūpāvasthānasvabhāvamatisūkṣmamādādate karaṇāntaragrahaṇālakṣaṇātāṁ vā bhajante lavaṇāhiṅguprabhṛtayah sūcanīyapariጀāmaśca jantivā punarapi viyati paritāḥ sakaladigantarāvarodhivāri-dharasvādinā sthūlenākāreṇa pariṇamante, TS., p. 373.
2. Parīcavihe poggalapariጀāme pañnatte tamjahā vaṇṇapariጀāme gaṁdhapariጀāme rasapariጀāme phāsapariጀāme and saṁthāṇa pariጀāme, BhS., 8. 10. 355;
- Ajīvapariጀāme...dasavihe pañnatte tamjahā - baṁdhapari-

colour), *gandhapariṇāma* (transformation of smell), *rasapariṇāma* (transformation of taste), *sparśapariṇāma* (transformation of touch), *samsthānapariṇāma* (transformation of shape), *bandhanapariṇāma* (transformation of binding or combination), *gatipariṇāma* (transformation of motion), *bhedapariṇāma* (transformation of division), *agurulaghuguṇapariṇāma* (transformation of neither heaviness nor lightness) and *śabdapariṇāma* (transformation of sound).

The transformation of colour, smell, taste and touch¹ takes place in all forms of matter as a result of integration and disintegration of forms of Matter by the applied, natural and applied-cum-natural processes. These ten kinds of *pariṇāma* of Pudgala are divided into the following kinds on the basis of their respective numbers. Hence *varṇapariṇāma* is of five kinds, viz. *kālavarnapariṇāma* (transformation of black colour) up to *śuklavarnapariṇāma* (transformation of white colour); *gandhapariṇāma* is of two kinds, viz. *surabbigandhapariṇāma* (transformation of pleasant smell) and *durabbigandhapariṇāma* (transformation of unpleasant smell); *rasapariṇāma* is of five kinds, viz. *tiktarasapariṇāma* (transformation of bitter taste), *kaṭukarasapariṇāma* (transformation of sour taste), *amlarasapariṇāma* (transformation of acidic taste), *kaṣāyarasarapariṇāma* (transformation of astringent taste) and *madhurarasapariṇāma* (transformation of sweet taste); *sparśapariṇāma* is of eight kinds, viz. *karkaṣasparśapariṇāma* (transformation of hard touch) up to *rūkṣasparśapariṇāma* (transformation of dry touch); *samsthānapariṇāma* (transformation of shape) is of five kinds, viz. *parimanḍalasaṁsthānapariṇāma* (transformation of one material substance into spherical shape) up to *āyatasaṁ-*

nāme, *gaipariṇāme*, *saṁṭhāṇapariṇāme*, *bheyapariṇāme*, *vāṇṇapariṇāme*, *garīḍhapariṇāme*, *rasapariṇāme*, *phāsapariṇāme*, *agaruyalahuyapariṇāme*, *saddapariṇāme*, *Paññavaṇā*, 13. 417.

1. Sparśādayaḥ paramāṇusū skandhesu ca pariṇāmājā eva bhavanti, TS. Śhā., 5. 24, p. 364.

sthānapariṇāma (transformation of one material substance into rectangular shape).¹ There are stated to be two kinds of bandhanapariṇāma (transformation of binding), viz. snigdha-bandhanapariṇāma (binding transformation of matter by cohesiveness) and rūkṣabandhanapariṇāma, (binding transformation of matter by dryness). The combination of forms of Matter takes place due to the cohesive (attractive=positive) and dry (repulsive=negative) forces of unequal degrees, but it does not occur in the case of equal cohesive force nor in that of equal dry force. That is, no combination takes place between two particles of matter having equal degree of the same property. But there is found to happen a combination of two particles of matter having unequal degrees of force of cohesiveness by two units more with cohesiveness and unequal degree of dryness by two units more with dryness. But no combination is possible to take place between the particles of matter having the lowest degree of two properties whether unequal or equal.²

In the process of combination the higher degree of property transforms the lower one,³ according to the Śvetāmbara view both the Śvetāmbara and Digambara views regarding the rules of combination of matter will be discussed in the tenth chapter in detail.

It is explained further that gaṭipatiṇāma (motion-transformation of matter) is of two kinds, viz. sparśagatipatiṇāma (transformation of tactile motion of matter, e. g. drawing pitcher goes down to the bottom of water by touching water) and asparśagati (transformation of non-tactile motion of matter) or dīrghagatipatiṇāma (long-circuit motion-transform-

1. BhS., 8. 10. 355; PV., 13; Samavāyāṅga, 22.

2. Goyamā ! duvihe paṇṇatte, tamjahā niddhabaṁ Jhaṇapariṇāme, lukkhabaṁdhaṇipariṇāme ya, samaniddhayāe bāmhe na hoi samalukkhayāe vi na hoi vemāyaniddhalukkhattāṇēa bāmḍho u khamḍhāṇam, niddhassa niddhena duyāhie nām lukkhassa duyāhie nām niddhassā lukkhena uvei bāmḍho jahaṇṇavajjo visamo samo vā, Paṇṇavaṇā., 13.

3. Bandhe adhikau pātiṇāmikau ca, TS., V. 36.

mation) and hrasvagatipariṇāma (short-circuit motion transformation).¹ Bhedapariṇāma (transformation of matter by division) is of five kinds, viz. khaṇḍabhedapariṇāma (transformation of matter by the division of it into parts), e. g. separate parts of a broken pitcher up to utkarabhedapariṇāma (transformation of matter by division like sawing, e. g. the sawing of a piece of timber). There is stated to be one kind of agurulaghupariṇāma, as it is taking place in all substances constantly by rhythmic rise and fall, while Śabdapariṇāma (transformation of sound) is of two kinds, viz. surabhiśabdapariṇāma and durabhiśabdapariṇāma (transformations of pleasant and unpleasant sounds).²

Besides, there are stated to be five kinds of indriyaviṣaya-pudgalapariṇāma (transformation of sense-object-matter), viz. Śrotrendriyaviṣayapudgalapariṇāma (transformation of auditory sense-object-matter) up to sparśendriya-viṣaya-pudgalapariṇāma (transformation of tactile sense-object-matter). They are again sub-divided into different kinds. Śrotrendriyaviṣayapudgalapariṇāma is of two kinds, viz. surabhiśabdapariṇāma (transformation of pleasant sound and durabhiśabdapariṇāma (transformation of unpleasant sound). Thus cakṣurindriyaviṣayapudgalapariṇāma is of two kinds, viz. surūpapariṇāma (transformation of matter into beautiful object) and durūpapariṇāma (transformation of matter into ugly object) and thus surabhigandhapariṇāma (transformation of matter into unpleasant smell) and durabhigandhapariṇāma (transformation of matter into unpleasant smell); thus surasapariṇāma and durasapariṇāma (transformation of matter into good and bad tastes) and a susparśapariṇāma and duḥsparśapariṇāma (transformation of matter into good and bad touches) respectively of the remain-

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1. Gaipariṇāme...Goyamā ! duvihe pañnatte tamjahā phusamāṇagaipariṇāme ya aphussamāṇagaipariṇāme ya ahavā digghapariṇāme ya hassapariṇāme ya, Pañnavanā, 13. 418.
 2. Pañnavanā, 13.

ning sense-object.¹ All these sense-objects i. e. matters undergo transformation into favourable and adverse states according to chemical behaviour.

Pleasant sounds (matters) undergo transformation into unpleasant sound and unpleasant sounds into pleasant sounds; beautiful matters change into ugly matters and ugly matters into beautiful matters; pleasant matters undergo transformation into unpleasant ones and vice versa, good tasteful matters into bad tasteful-ones and vice versa, matters of pleasing touch into matters of painful touch and vice versa.²

THE SĀMKHYA-YOGA VIEW ON TRANSFORMATION OF MATTER

According to the Sāṃkhya-Yoga philosophy, Prakṛti, the fundamental cause, is all-pervasive; it is outside the scope of beginning and end in time. There is the finest seed of motion and rest in it and it cannot exist even for a moment without undergoing transformation into newer and newer forms. It preserves its own fundamental nature as permanent because of there being such nature in it. There is the capacity of expansion in it, i. e. to undergo transformation from the finest conditions into fine conditions and from the fine into the grossest material state by such order on account of which it is only one Reality. Just as the seed of a banyan tree brings forth into existence a huge banyan tree, just so the Prakṛti gives form to the multifarious universe by self-generated capacity without the impetus of any other entity.

"Change is taking place everywhere, from the smallest and least to the highest. Atoms and reals are continuously vibrating and changing places in any and every object. At each moment the whole universe is undergoing change, and the collocation

1. Jīvābhigama, 191-192.

2. Nāyādhammakahā, 92; Jīvābhigama, 191, 192.

of atoms at any moment is different from what it was at the previous moment.”¹

Energy (Rajas) works on the original infinitesimal units of Mass (Bhūtādi), absolutely homogeneous and absolutely inert and ubiquitous, being devoid of all physical and chemical characters (rūpādibhirasamyaṭam) except quantum (paricchinnatva parināma). The action of Energy on the original units produces the infra-atomic unit-potentials (tanmātras) charged with different kinds of Energy. It “represents the subtle matter—vibratory, impinging, radiant, etc. instinct with potential energy.” These “potentials” arise from the unequal aggregation of the original Mass-units in different proportions and collocations with an unequal distribution of the original Energy (Rajas).²

Dr. B. N. Seal explains the Sāṃkhya process of transformation of matter in this manner; “the potentials lodged in subtle matter must undergo peculiar transformations by new grouping or collocations to be classed among sensory stimuli—gross matter being supposed to be matter endowed with properties of the class of sensory stimuli, though in the minutest particles thereof the sensory stimuli may be infra-sensible (atīdriya but not anudbhūta).”³

“First, the “potential” of the sound-stimulus is lodged in one class of Tanmātras—particles which possess the physical

1. History of Indian Philosophy, Vol. I. p. 250,
2. The Positive Sciences of the Ancient Hindus, pp. 24-25;
Tanmātrarūpādeḥ kīm kāraṇam iti cet svakāraṇadravyā-
ṇam nyūnādhikabhāvena anyo’ anyam prati samyogaviśeṣa
eva svajātiyopastambhādinā vṛddhibhrāsādikam ca yuktam,
Vide The Positive Sciences of the Ancient Hindus, p. 25.
3. Tasmīṁstasmīṁstutanmātrāḥ te cā’ aviśeṣīnah, te ca padār-
thāḥ śāntaghoramūḍhakhyaiḥ sthūlagataśabdādiviśeṣaiḥ
śūnyā ekarūpatvāt, tathā ca śāntādiviśeṣaśūnyaśabdādima-
ttvameva bhūtānām śabdāditanmātratvām.
Vide The Positive Sciences of the Ancient Hindus, p. 25.

energy of vibration (*parispanda*), and serve to form the radicle of the ether-atom (*ākāśaparamāṇu*); then the potential of the tactile stimulus is lodged in another class of *Tanmātras*, particles which possess the physical energy of impact or mechanical pressure in addition to that of vibration, and serve to form the radicle of the air-atom (*vāyu-paramāṇu*), next, the potential of the colour-stimulus is lodged in a third class of *Tanmātras*, particles, which are charged with the energy of radiant heat and light, in addition to those of impact and vibration, and serve to form the nucleus of the light and heat corpuscle (*teja paramāṇu*), then the potential of the taste-stimulus is lodged in other *Tanmātras*, particles which possess the energy of viscous attraction, in addition to those of heat, impact, and vibration and afterwards develop into the atom of water (*ap paramāṇus*) and lastly, the potential of the smell-stimulus is lodged in a further class of *Tanmātras*, particles which are charged with the energy of cohesive attraction, in addition to those of viscous attraction, heat, impact and vibration, and which serve to form the radicle of the earth atom.”¹

TRANSFORMATION OF MATTER IN THE NYĀYA-VAIŚEṢIKA PHILOSOPHY

Transformation of Matter takes place in the form of chemical action in its different forms in accordance with the

1. The Positive Sciences of the Ancient Hindus, pp. 25-26; *Śadviśeṣāḥ tadyathā śabdata-nmātraṁ sparsa-ta-nmātraṁ rūpa-ta-nmātraṁ, rasata-nmātraṁ, gandha-ta-nmātraṁ ca ityekadvitri-catuṣ-pañcālakṣaṇāḥ śabdādayaḥ pañca-viśeṣāḥ*, *Vyāsa-bhāṣya* on *Yoga-sūtra*, 19, pāda II, p. 88; *Ahaṅkārāt śabdata-nmātraṁ tataścāhaṅkāra-sa-ha-kṛtāt śabdata-nmātrāt śabdasparsa-igunāt sparsita-nmātraṁ evaṁ krameṇa ekaikagunāvṛddhyā tanmātrāṇi utpadyante, Sāṁkhyapravacanabhbāṣya*, 1.62;

following rules; (1) Kāraṇaguṇapūrvakah kāryaguṇo dṛṣṭah,¹ (2) samānajātīyasaṁyogaḥ dravyārambhakah na vijātīyasaṁyogaḥ, (3) apākajarūparasagandhasparśaparimāṇaikatvaikapṛthaktvagurutvadrasavasnehavegāḥ kāraṇaguṇapūrvakah and (4) rūparasagandhānuṣṇasparśaśabdaparimāṇaikatvaikapṛthaktvasneheḥ samānajātyārambhakah.²

The Nyāya Philosophy agrees with the Vaiśeṣika on this point “kāraṇaguṇapūrvakah kāryaguṇo dṛṣṭah” (the quality of the composite product is produced by the corresponding quality of the constitutive cause as a rule). But it differs from the latter in regard to a particular class of events, viz. the emergence of new qualities in earth-bodies due to the action of heat. That is, it is a kinds of conjunction of the taijasa (fiery) elements by which the previous colour, etc., of the earth-atom are destroyed and another colour, etc., are produced in their place.

On the contact of an earthly object with fire in a furnace

Śabdādinām mūrtisamānajātīyānām ekaḥ pariṇāmaḥ pṛthivīparamāṇuh tanmātrāvayavaḥ bhūtāntareṣu api snehausṇyaprāṇāmitvā avakāśadānāni upādāya sāmānyam ekavikārārambhah samādheyah, Vyāsabhāṣya;

Sū. 14, padā IV;

Tadyathā gandharanmātrāṁ varjjayitvā catustanmātrāṇāṁ snehajātīyānām ekaḥ pariṇāmaḥ jalaparamāṇuh teṣāṁ ca mahājalādiḥ, evam gandharasau varjjayitvā auṣṇyajātīyānām tritanmātrāṇām tejo’ aṇuḥ tebhyaḥ mahātejādiḥ evam gandharasarūpānām varjianāt dvābhyām vāyvāṇuh tebhyaḥ mahāvāyādiḥ, evam śabdatanmātrādahaṅkārāṁśasahakṛtāt, ākāśānuḥ tebhyaḥ mahākāśādiḥ,

Vijñānabhikṣu remarks: atra darśane ayam siddhāntah śabdāditanmātrapañcakē kāthinyasnehādivyaṅgyāḥ pṛthivītvādijātīyah santi, Yogavārttika, Sū. 14, pāda IV. Vide P. S. A. H., pp. 26-27.

1. VS., II. I. 24.

2. PPBhā., Guṇapadārthanirūpaṇām.

a motion is generated in the ultimate constituent particles of it through the forcible contact (abhighāta) or impulsion (nodana)¹ of fire. As a result of this motion the disjunctions are generated by it in its turn; they cause the destruction of the conjunctions in existence between the various parts of the composite and finally convert them to their ultimate particles. Later, on the destruction of their qualities by these particles, again fresh qualities are generated in place of the old ones by a fresh similar contact of fire. They are called pākajas (transformed by chemical action). There are stated to be two kinds of pāka (chemical action), viz. pīlupāka and pītharapāka.²

Pīlupāka

An unbaked earthen pot is black, but after it is burnt it

1. Pārthivaparamāṇurūpādīnām pākajotpattividhānam ghaṭaderāmadravyasyāgninā sambaddhasyāgnyabhighātānnodanādvā tadārambhakeṣṭvanuṣu karmāṇyutpadyante tebhyo vibhāgebhyah samyogavināśah samyogavināśebhyaśca kāryadravyān vinaśyati tasmin vinaśte svatantrēsu paramāṇusvagnisamyoगादauṣ्णyāpeksācchyāmādinām vināśah punaranyasmādagnisamyoगादauष्णyapeksāt pākajā jāyante, PPBhā, Pākajaprakaraṇam.

2. Kāraṇaguṇapūrvakāḥ pṛthivyām pākajāḥ, VS., 7. 1. 6; Pīlavāḥ-paramāṇava eva svatantrāḥ pacyante, tatraiva pūrvarūpanāśāgrimārūpādyutpattiḥ kāraṇaguṇaprakramena cāvayavinirūpādyutpadyate iti pīlupākavādināḥ, VSU., 7. 1. 6;

Tatrakāryakāraṇasamudāya eva pacyate iti pītharapāka-vādināḥ, Ibid., PPBhā., Pākajaprakaraṇam;

Pārthivaparamāṇurūpādīnāmiti yadyapi paramāṇava eva pṛthivi tathāpi te kāryarūpapṛthivyapeksāyā pārthivā ucyante...yatra pūrveśām vināśādaparesāmūtpādastameva prakāraṁ darsayati...etc. NK., p. 107; KV., p. 183; NM., Pt. II., pp. 11-12; Udyotakara, chap. III, Āhnika 1, Sūtra 4.

the potter's furnace, it becomes red all over, both inside and outside. There is a controversy on this simple phenomenon leading to the question whether does the pot undergo a complete disintegration when acted upon by the fire in the furnace under the influence of fire or does it remain intact in its structure. Does the change of colour from black to red take place in the atoms or in the body with its structure intact ? The Vaiśeṣika maintains that when the unbaked earthen pot, etc., are brought into contact with fire, motion is produced in the atoms of it by the forcible striking (abhighāṭa) or pressure (nodana) of fire. Disjunction is produced by this motion in the constituent of the pot and it is followed by the destruction of the conjunction existing between the various constituents of the composite and finally their splitting up into atoms. After the complete disintegration of the body of the unbaked earthen pot a second impact of fire-particles upon the isolated atoms (pīlu-anus) destroys their original attributes like colour, etc., and converts them to their original conditions. A third impact of fire, which occurs, generates fresh attributes, i. e. red colour, etc., in these atoms in place of the old ones. Thereafter, a reverse motion is generated by the influence of the unseen force of the individual selves in the liberated and homogeneously transformed atoms which combine together by twos. The combination of the red dyads results in the corresponding triads, thus the process leads to the production of the red pot of the original magnitude and shape.¹

The merit of the theory of Pīlupākaja (chemical action in isolated atoms) is that it follows strictly the dictum "The quality in the effect is necessarily the outcome of the correspon-

1. Āpāke nihksiptasya ghaṭāderāmadravyasya vahninā nodanādabhīghatādvā tadārambhakeṣu paramāṇuṣu dravyārambhakasāmyogavirodhivibhāgenārambhakasāmyoganāśe dravyanaśāvaśyambhāvāt dṛṣyate hi sthālyāmāhitānām, etc. VSU., 7. 1. 6: PPBhā., Pākaja prakaraṇam.

ding quality of the cause.”¹ That is to say, according to the Vaiśeṣika doctrine of Piṭupākaja, the emergence of new qualities takes place in the isolated atoms (piṭus) as a result of the action of heat.

Piṭharapāka

The theory of Piṭharapākaja propounded by the Naiyāyikas maintains that the change of qualities takes place in the whole body (piṭhara), remaining structurally intact,² as a result of the action of heat on the following grounds. It is perceived that a pot remains structurally intact even when it is being burnt by the fire inside the potter's furnace.³ The recognition of the identity of the burnt pot and the unbaked one is not invalidated by a subsequent experience, but it stands as conclusive proof against the Vaiśeṣika view which holds the two pots to be entirely different both numerically and qualitatively.⁴ Secondly, it will be very difficult to explain the point how does the pot preserve its position when placed on the furnace which also is disintegrating by the action of heat, if the Vaiśeṣika theory of the decomposition of bodies by the action of heat is considered to be valid.⁵ Thirdly, the Vaiśeṣika theory of wholesale destruction and reaction makes it difficult to explain the question how should the reconstituted pot possess the same magnitude and shape as the original unbaked pot. Fourthly, it seems to be peculiar that an absolute new pot is found to exist exactly in the same condition in which the unbaked pot was

1. VSU., 7. 6, PPBhā., Pākajaprakarāṇam, 3. VS., 7. 1. 6.

2. VSU., 7. 1. 6; PPBhā., Pākajaprakarāṇam; NK., p. 107; KV., p. 183; NM., Pt. II, pp. 11-12; Udyotakara, chap. III, Āhnika 1, Su 4.

3. VV., p. 447 (Vyomavati)—a commentary on PPBhā. by Vyomaśivācārya ed. CSS. “Evaṁ ghaṭādīnāmavasthāityavāṁ/na ca ghaṭādervināśe kardamādibhirvinā punarutpattiyuktā, etc.

4. VV., p. 447.

5. VV., p. 447.

placed, even though it is entirely annihilated and an absolutely new one is produced.¹ "The change of position is, however, a matter of natural expectation, as is seen to be the case with bubbles of water among which the disappearance of one is followed by the appearance of another but not necessarily in the same place."² Fifthly, the reproduction of the pot from the atoms into which the old pot was dissolved is supposed to take place without the essential conditions of the wheel, the staff, the measuring rod, etc., and without the activity of the potter. It seems to be a miracle, for the accepted law of causation is given here a wide scope³ against the ordinary course of experience.

The Naiyāyikas deals with the question how does fire enter into the structure of the pot inside and outside without destroying it in this manner that the particles of fire can enter into its structure through its pores, for the porosity of the body of the pot is an undeniable fact proved by the oozing out of water particles out of it or the coolness of the outer surface.⁴ The porosity of an earthen body is demonstrated by the conduction of heat through it to boil the water or by the boiling of the paddy inside the pot without destroying it by way of decomposition and recombination. The conduction of fire into the structure of the pot is not resisted by the pot nor the entry of the fire particles into it disintegrates its structure, for it is not an absolutely compact and impervious body which might not allow the penetration of fire into it. The entry of the minute particles of fire through the pores into its structure, though a mass of fire cannot effect an entry into it, makes the baking of the whole pot inside and outside.⁵

1. VV., p. 447.

2. NP., p. 312, vide Studies in Nyāya-Vaiśeṣika Metaphysics, p. 96.

3. Na ca ghaṭādervināśa karmā libhirvinā puṇarutpattiyuktā, VV., p. 447.

4. VSU., VII. 1. 6.

5. Ye bijāvayavāste pūrvvavyūhaparityāgena vyūhāntaramā-

Śrīdhara contends this theory of the Naiyāyikas by raising the point that atoms and dyads constituting the body of the pot are not porous, for atoms are indivisible and dyads are devoid of extensity. If it is so, that would imply that atoms forming a dyad is not conjoined. The conjunction of atoms in a dyad does not leave a gap between them nor the conjunction of dyads in a triad admits of any gap between them, as dyads also do not possess extensity. The pot is a composite and compact body. The fire can effect an entry only into its body, if the constitutive dyads are split up into atoms, thus making possible for the entry of fire to reach the inside of its body.¹

In reply to this argument of Śrīdhara, the Naiyāyikas maintain that there is a possibility of the gap between triads, for conjunction is in respect of parts.² Besides, the passage of

padyante vyūhāntarāpattau ca pṛthivīdhāturabdhātunā
saṃgrhītāntareṇa tejasā, pacyamāno rasadravyam nirvar-
ttayati, sa rasah pūrvvāvayavasabito aṅkurādibhāvamāpa-
dyate paramāṇavasthāni bijāni bhavantītyetanna prati-
padyāmahe, yasmācchālyādibijamucchūnāvasthāmādiṁ
kṛtvā yāvadupāntyam śālibijakāryam tāvanna kadācit
paramāṇavasthām bhavati, yadi tu syāt kadācit nopala-
bhyeta, NV., Udyotakara, Chap. III, Āhnika 1, Sūtra 4;
Praktisūśratayaiva kāryadravyasya ghaṭādih ārambhāt
antastejaḥ kaṇānupraveśakṛtapākopapatteḥ alaṁ vināśakai-
panayā pitharapākapakṣa eva peśalah, NM., Pt. II; see
NV., III. 4; VV., p. 448.

1. NK., p. 109;
Na tāvatparamāṇavaḥ sāntarāḥ, nirbhāgatvāt, dvyāṇukasya
sāntaratve cānupattireva, tasya paramāṇvorasaśāmyogāt
saṃyuktau cedimau nirantarāveva, sabhāgayorhi vastunoh
kenacidaṁśena saṃyogāt kenacidasamānyogāt sāntarah saṃ-
yogaḥ, nirbhāgayostu nāyam vidhiravakalpate sthūladra-
vyesu pratīyamāneśvantaram na pratibhātyeva, tryaṇuke-
śvevāntaram...na kalpyete, NK., pp. 262-3.
2. Yadi cānupraviśya dravyam dravyāntaram vyatibhinatti tena
cākṣusasya raśmer anupraveśāt sphatikādi vinaśtamiti,
NV., III. 1. 4, p. 353.

light through the hard transparent bodies like glass and crystal to things situated beyond is the positive proof that the things which appear to be compact are not really so and they cannot resist the penetration of such fine things like the atoms of light.¹ The fact of the passage of one material substance through another demonstrates that take wholesale disintegration of the body is not a necessary precondition for the operation of heat and for the emergence of the new physical qualities.

In answer to the Vaiśeṣika point that the hard and red baked pot is a distinct entity from the soft and black unbaked one on account of their functional characteristics and the impossibility of the occurrence of the contradictory attributes in a self-identical substance, the Naiyāyikas maintain that the identity of a thing can be made only by recognition without contradiction. In this case the recognition of identity is obvious and conclusive. The successive emergence of contradictory qualities does not annul the identity of a thing, e.g. a piece of cloth, when drenched in water, becomes wet and dries, remains the same cloth. In refutation to the Vaiśeṣika view that recognition is not necessarily a proof of identity as it is observed to make a mistake in such cases like the flame of light and the stream of water, the Naiyāyikas explain that the recognition of identity of the flame of light is vitiated by forceful arguments. It is directly perceived that there is the difference of size of the flame at different moments and the wick's oil and the action of fire also change every moment. Therefore it is shown by the difference of causal conditions as well as of the qualities of the flame that the flame in question is not one but a series of phenomena which are misconceived to be identical on account of their quick succession and close similarity. The apparent identity of a stream of water can be explained. So the Vaiśeṣika argument that all recognitions are equally

1. Na viruddhasaṁsparśavattvenā'avayavino bhedo'bhimataḥ, avayavina'ekatvena pratyabhijñānāt, NP., p. 313.

erroneous according to these cause in general and that recognition in the case of the baked one in particular is more vitiated by prejudice than logic.¹

The Vaiśeṣikas opine that the advocate of the theory of Piṭharapākaja accepts the possibility of the recognition of the sameness of magnitude and shape in the case of a slightly mutilated pot, e. g. a pot perforated in the neck with a needle is recognized to be the same pot even though mutilated, but logically it cannot be the same original whole pot,² as it is lost of a part, though small. The whole exists in the totality of the parts and cannot dispense with any of these parts without losing its identity. If the whole is deprived of one or two parts, it ceases to exist and another whole deprived of parts emerges.

In reply to this argument the Mīmāṃsakas argue that "the loss of one or two parts does not entail the disappearance of the whole as the recognition of identity proves its continuance in the parts that are left over."³

The Vaiśeṣikas refute this point by explaining that a whole which exists in a determinate number of parts cannot continue to exist in excision or accretion of part of a two in it. The Mīmāṃsaka example of diminution of magnitude of a piece of cloth due to contraction does not suggest the subtraction of parts or its expansions; a fresh accession of parts does not fit

1. NP., p. 311.

2. KV., p. 188;

Rūparūpāśādeva vinaśyati, kāryarūpatvāt naśta-
ghātarūpavādi (!) tyasyāpi pratyayasya pratyabhijñānirdali-
tatvāt,...piṭharāvayavānām tathā tanmadhyapatitadvyanu-
kasyāpi kā jīvitavyavasthitivatyanumānamapudyamāsā-
dayati, NLV., pp. 831-2;

VSU., VII. 1. 6. KR., p. 60

3. The Mīmāṃsakas appear to be the earliest exponents of the doctrine of Piṭharapāka.

well so the argument does not dislodge the position of the Vaiśeṣikas.¹

As to the Naiyāyikas' point regarding the absence of the potter and his apparatus for the production of a new pot it is explained by the Vaiśeṣikas that the production of the mutilated pot also did not wait for the potter and his apparatus. So the Vaiśeṣikas maintain that the production of a new pot in super-session of an old one does not necessarily wait for the usual causal condition.²

Besides, according to the Vaiśeṣikas, the process of disintegration of parts in the unbaked pot by the action of fire is gradual and it takes place in and through its parts. So also is the process of reintegration of parts of it. Consequently, there is the emergence of some fresh parts with the changed qualities when there takes place the destruction of some parts. This synchronism of these two processes does not allow to perceive the structural or dimensional change in the reconstituted pot from the disintegrated one.³

It appears from the above analysis of Piṭupāka and Piṭhara-pāka that the latter process seems to be more acceptable for the physical sciences have demonstrated that heat can penetrate into a piece of metal and bring about a change in its internal structure without destroying the magnitude of it. Taste, smell and colour also change with its chemical action. The Jaina view⁴ also supports this contention in this way that there takes place a transformation of guṇas (qualities) in some dravya (substance) having no integration and disintegration of atoms in it.

1. KV., pp. 188-189; VSU., VII. 1. 6.

2. VV., p. 448.

3. NK., p. 110 (p. 265) of Vārāṇasi Samskr̥ta Viśvavidyālaya edition

4. Kammivi puṇa tadvatthevi hoi guṇavipparīṇāmo,
Paramāṇu-khaṇḍasat̄triṁśikā, (14), p. 3;
Ghatadravye tadvasthe api pākena prāktanamṣyāmarūpā-
diguṇanāśadarśanāt (14), Ibid., p. 3.

THE VEDĀNTIC VIEW ON TRANSFOR- MATION OF MATTER

As already pointed out, the world evolves out of Māyā by a process of self-alienation of the Absolute Brahman which produces first Ākāśa, and other classes of subtle matter evolve from Ākāśa in an ascending linear order. The Mahābhūtas (gross elements) are produced by the process of Pañcikarana (quintuplication). On the formation of the Mahābhūtas once "the different kinds of substance are derived from them by the evolutionary process called parināma".¹ There takes place constantly the change of state in Matter." The effect is only the cause in a new collocation."²

There are stated to be two kinds of change, viz. (1) change by a spontaneous process, without external influence including isomeric change (*svābhāvika-parināma*). This *svābhāvika parināma* corresponds to the Jaina Visrasā parināma, i. e. spontaneous integration and disintegration, but it is directed against the Naiyāyika doctrine of Ārambhavāda—action from without, impressed force abextra (*adṛṣṭa*) and (2) change as a result of the combination with other substances. It corresponds to the Jaina parināma of matters by combination or binding (*bandhanaparināma*). "Such combination may produce (a) a compound substance possessing like—qualities with the constituents (*samānajātIyotpatti*) or (b) unlike compounds with new qualities "heteropathic effects" (*vijātIyotpatti*). Any new quality thus evolved through (chemical) combination is called sambhatabhūtadharma, e. g. the intoxicating power of the fermented rice and molasses, which does not exist in the ingredients taken separately (*madyabijānām pratyekam avarttamānāpi samudāyaśaktyā madaśaktih dṛsyate*). This sambhūyakriyā (sambhūyakriyā samutthāna) corresponds to the chemical combination, and the Vedāntists, like the Sāṃkhya, explain this

1. The Positive Science of the Ancient Hindus, p. 89.

2. Ibid.

only as the transformation of the latest Energy (śakti, and-bhūtaśakti (in a new collocation (saṁsthāna avayava—sanni-veṣa). But, unlike the mediaeval Sāṁkhya, the Vedānta freely recognises the combination of heterogeneous Bhūtas. Thus Earth, Ap, Tejas, and Vāyu freely combine in a different proportions and groupings to produce the variety of substances in the world. For example, the animal organism is a compound of all the five Bhūtas (pañcabhūtika). It is not merely the concomitant or efficient causes that may be heterogeneous to the material cause as the Naiyāyikas contend, but several heterogeneous substances (or Bhūtas) may unite as "material causes to produce a new substance."¹

I. The Positive Sciences of the Ancient Hindus, p. 90;

Pañcikaraṇa :—

Dvidhā vidhāya caikaikam caturddhā prathamam punah Svastesaradvitīyāṁśairyojanāt pañca pañca te.

Yathā trisargaśrutanau sṛṣṭānām bhūtānām sphuṭataravyavahārau nāmarūpasya karaṇopāyatayā trivṛtikaraṇām śrutanām tadvat bhūtapañcakasargaśrutanau api tathā, tadānīm pañcikaranāntaram ākāśe śabdo' abhivyajyate sphuṭatayeti sarvvatra yojanīyam (Vidvanmanorañjinī)—asti hi śarīre sarvveśāmapi bhūtānām kāryasāmpratipattiḥ avakāśavyūhanapavanakledanakāṭbinyānām sarvajanānubhavasiddhatvāt, atastatkāraṇatayā pañcāni bhūtāni ekasmin dehe saṁśiti sthite tantupaṭayoriva avayavāvayavityameva pañcabhūtadehayoruktam, na ca sparśa-śūnyatvāt ekadravyatvāt ca ākāśaya ārambhakatvānupapattiriti vācyam, ārambhavādasya anaṅgikārāt, ekasyāpi dugdhāvaya-vino dadhyārambhakatvādarśanāt vastutastu pañcānām pañcātmakatvasya darsītatvāt ārambhavādasya nirākṛtatvāt ca tasmāt siddham śarīram pañcabhautikamiti Ibid., pp. 91-92;

Na tāvat samānajātīyameva ārabhate na bhinnajātīyamiti niyamo vāsti, samavāyikāraṇe eva samānajātīyatvābhyupagamāḥ na kāraṇāntaravīṣaya iti tadapi anaikāntikam, nāpi anekameva ārabhate naikamiti niyamo'asti anumanasorādyakarmmā-rambhābhyupagamāt, ekaiko hi paramānuścādyām svakarmā-rambhate na dravyāntaram saṁbhātya ityabhyupagamyate dravyā-

In the physical sciences the transformation of Matter is explained by the chemical behaviour of it in the following manner "why molecules can sometimes inter-change atoms and form new substances, and why molecules already formed can sometimes dissociate again into separate atom."¹ These questions correspond to the Jaina Sūtras "Bhedasaṅghātebhyaḥ utpadyante"; "Bhedādaṇuh" (Molecules are formed by division, combination and division-cum-combination); the atom is produced only by division). "The answer is to be found by considering in rather more detailed, the significance of the energy relationships involved and the role of temperature. Without defining temperature rigorously, we can assert that the most important consequence of change of temperature is that the amount of energy associated with an atom, molecule, crystal, droplet, or other system changes in the same sense. High temperature means high energy and low temperature means low energy, although in any collection of atoms or molecules the different particles do not all have the same energy; there is a distribution of energies over a range. In a gas, for example, the average velocity will be higher at high temperatures. The tendency of a pair of atoms to approach to the distance of lowest energy of interaction will clearly be affected by what the temperature actually is. If we consider as an example a mixture of sodium and fluorine at such a high temperature that both elements are gaseous, we can safely assert that there will be molecules

rambhe eva anekārbambhakatvaniyama iti cet na pariṇāmā-bhyupagamāt, tadeva tu dravyam viśeṣayadavasthāntaram āpādyamānām kāryam nāmābhyupagamyate, tacca kvacit anekām parinamate mṛdibhāṇkurādibhāvena kvacidekām parinamate kṣīrādi-dadhyaśibhāvena neśvaraśāsanam asti anekām eva kāraṇam janayati iti, ŚBhā, Sarīraka-Bhāṣya, Sūtra, 7, pāda III, Adh., 3, Vide The Positive Sciences of the Ancient Hindus, p. 92.

1. Atoms and the Universe, p. 132.

of sodium fluoride present and free sodium and fluorine. Then at higher temperatures the portion of free sodium and fluorine will increase. Also, the proportion of the fluorine which is in the form of single atoms rather than in the molecules will increase at high temperatures. The precise composition of such a mixture could in fact be worked out if we knew all the quantities of energy actually involved.

In more complex chemical reactions in which atoms are interchanged between molecules there are more quantities of energy to be considered. There are the energies which have to be supplied before the separate molecules can be dissociated and also the energies gained by formation of the new types of molecules. Even in a gaseous mixture there will be ample opportunity for interchanges during collisions between molecules. The course of a given chemical reaction will depend on all these quantities of energy and upon the temperature, and also on the concentrations in which the various substances are present.”¹

The chemical behaviour as explained above is similar to the Jaina conception of evolution of matter by the process of combination, of dissociation and of both combination and dissociation of atoms.

Besides, in the physical sciences solid, liquid, and gaseous states of Matter and their respective changes of state are explained in the following manner: “From X-ray studies it is known that in crystalline solids the atoms are all located at definite points in a lattice arrangement. The atoms vibrate about these lattice points, the amplitude of the vibration increasing with the rise in temperature. At the melting point, which occurs at a fixed temperature different for crystalline substance, the amplitudes of the vibrations have become so large as to disturb the orderly arrangement of the atoms. Heat energy absorbed by the solid during the melting process is

1. Atoms and the Universe, pp. 132-133.

used in overcoming the attractive forces between the molecules and so producing increased molecular potential energy. Amorphous substances, such as, wax, tar and glass, as well most alloys, do not have sharp melting points but rather pass from the one state or phase to the other over a range in temperature of a few degrees. The change from the solid to the liquid state is known as melting, or fusion, the reverse change, as freezing. During freezing the molecules in settling down into their lattice positions have their potential energy changed back into kinetic energy, part of which is given as heat energy to the immediate surroundings.

When a liquid changes to the gaseous state, a process known as vaporization, there is a further much larger increase in the average distance between molecules. Heat energy is absorbed by the liquid to supply this increase in potential energy, or internal energy, of the substance. In addition, a portion of the absorbed heat energy is consumed in doing external work in the expansion against the pressure confining the substance. In the reverse change from the gaseous to the liquid phase, known as condensation, energy must be given up as heat energy to the surroundings.

The transition directly from the solid state to the gaseous state, called sublimation, also occurs. It takes place; for instance, when "dry ice" at atmospheric pressure changes to carbon dioxide gas without going through the liquid phase. To produce sublimation there is, of course, an absorption of heat energy in order both to increase the potential energy of the molecules and to do the external work in the large expansion against the pressure of the atmosphere."¹

The Jaina conception of change of state of Matter "Bhedasaṅghātābhyaśām cākṣusāḥ" (Molecules produced by the combined action of division and combination can be perceived by the eyes) is comparable to the process of change of states of Matter from the solid to the liquid and from the liquid to the

1. Physics—Principles and Applications, p. 261.

gaseous and the process of the reverse change of state from the gaseous to the liquid and from the liquid to the solid state as explained in physics. According to the Jaina Metaphysics, the invisible matter becomes visible by the combined process of division and combination, and not by division, for "when a molecule of minute size splits, it does not give up its minuteness. Hence it is invisible. Again another minute molecule splits. It combines with another molecule, gives up its minuteness and attains grossness. Then it becomes visible."¹

It is to be noted that in the gaseous state the particles of matter become invisible, while in the liquid and solid states they become visible. That is to say, some of the molecules are visible and some are invisible, though they are composed of even an infinite number of atoms.

1. Reality, p. 155;

Anantānantaparamāṇusamudayaniśpādyo'pi kaścicca-
kṣuṣah kaścidacākṣuṣah, tatra yo acākṣuṣah sa katham
cākṣuso bhavatṛti ceducyate, bhedasaṅghātābhyañ cākṣuṣah
na bhedāditi ka kātropapattiriti cet? brūmah sūkṣma-
pariṇāmya skandhasya bhede saukṣmyāparityāgādaca-
kṣuṣatvameva saukṣmyāpariṇataḥ punaraparāḥ, satyapi
tadbhede anyasaṅghātāntarasāmyogāt saukṣmyapariṇāmo-
parame sthaulyotpattau cākṣuso bhavati,
SS., 5. 28 (Comm.), p. 299.

COMBINATION OF MATTER PARTICLE

In the Jaina Āgamas¹ it is stated that the combination of ultimate atoms takes place as a result of the chemical behaviour of the properties of matter of unequal degrees : snigdhatva (cohesiveness of attractive force), rūksatva dryness or repulsive force) and snigdhatvarūkṣatva (cohesiveness-cum-dryness=attractive-cum-repulsive forces), which are inherent in both ultimate atoms and molecules having two up to infinite units. It lasts for one samaya (instant) in the minimum and innumerable times in the maximum. The two ultimate atoms combine together into a molecule because of their having the property of snehakāyatva.² Molecules also integrate and disintegrate into two, three units, etc.³

On the basis of the Āgamic statement Umāsvāti explains the combination of matter in this manner that it takes place by virtue of the properties of cohesive and dry forces⁴ which are associated with them. The origination of the material aggregate (i. e. molecules) occurs only as a result of the mutual contact of unitary (discrete) ultimate atoms, etc.⁵ For this reason, besides the contact (samyoga), there is something else for

1. Paramāṇu-poggalā ..vemāyaṇiddhayāe dvemāyalukkhayāe
vemāyaṇiddhalukkhayāe ..bañlhe samuppajjai, etc.,
BhS., 8. 9. 345;
See also Paññavaṇā, 13, 418; Bhandhasaṭṭrimśikā, p. 10.
2. Do paramāṇu-poggalā egayo sāhaṇamti donham paramāṇu poggalāṇam atthi siñehakāe, BhS., 1. 10. 80.
3. Kham shevi ya ḥam asāsa e sayā sa niyam uvacijjai ya avacijjai ya, BhS., 1. 10. 80.
4. Snigdharūkṣatvādbandah, TS.; V. 32, p. 420.
5. Snigdharūkṣayoh pudgalayoh spr̄ṣṭayorbandho bhavati,
TS., Bhā., 5. 32, p. 420.

its production. The purport of the aphorism "Snigdharūkṣatvādbandhah" is to show this fact. In addition to the mutual conjunction, it is also necessary that there should be the properties—cohesiveness and dryness (i. e. attractive and repulsive forces) in them. When cohesive and dry constituent parts combine mutually with each other, there takes place their binding-transformation of oneness (integration). The molecules like dyads, etc., are produced by this combination. There can be two kinds of combination of cohesive and dry constituent parts, viz. similar (sadṛṣa) and dissimilar (visadṛṣa). The taking place of combination of the cohesive constituent with the cohesive one and that of the dry constituent with the dry one is called similar combination (sadṛṣabandhana), while the combination of the cohesive constituent with the dry one is dissimilar combination (visadṛṣabandhana).¹ So there are stated to be two kinds of bbandhanapariṇāma (binding-transformation of matter), viz. snigdhabandhanapariṇāma (binding-transformation of the cohesive constituent parts) and rūkṣabandhanapariṇāma (binding-transformation of the dry constituent parts).²

The general rules of the combination of matters are as follows : (1) There does not take place a combination of the cohesive and dry constituent elements of matter having the quantum of the minimum (lowest) properties (energies),³ i. e. there does not occur a combination of ultimate atoms having the minimum quantum of properties. (2) On account of there being equal quantum of properties there does not take place a

1. TS., 5. 34.

2. Baṁḍhaṇapariṇāme naṁ Bhāṁte ! kaivihe paṇṇatte ? tamjahāṇiḍdhābaṁḍhaṇapariṇāme, lukkhabāṁḍhaṇapariṇāme ya, Paṇṇavaṇā; 13;

Samaṇiḍdhayāe baṁḍho na hoi samalukkhayāe vi na hoi Vemāyaṇiḍdhālukkhattāneṇa baṁḍho u khaṁḍhāṇam, etc.
Ibid.

3. Na jaghanyaguṇānām, TS., V. 33, p. 421.

combination of similar constituent particles of matter.¹ That is to say, there is no possibility of a combination of the cohesive constituent part with the cohesive one and that of the dry constituent part with the dry one. (3) Ultimate atoms having equal degree of cohesiveness or dryness, and being of the same kind, cannot combine with ultimate atoms of their own kind.² (4) There takes place a combination of similar or dissimilar constituent parts having the difference in their degrees of cohesiveness or of dryness by two units more.³

In the three sūtras “Na jaghanyaguṇānām Guṇasāmye sadṛśānām, Dvyadhikādiguṇānām tu”, the first sūtra forbids the combination of matters on the ground that there cannot take place a mutual combination of ultimate atoms having the minimum properties of cohesiveness or of dryness in them.⁴ It is revealed by this fact of negation that there can be a mutual combination of all cohesive or dry constituent elements having medium and maximum⁵ degree of these properties. But in this rule also there lies an objection which is explained in the next sūtra “Guṇasāmye sadṛśānām.” According to it, there cannot take place a mutual combination of similar constituents having equal degrees of properties of cohesiveness

1. Guṇasāmye sadṛśānām, TS., V. 34, p. 422.

2. Ibid.

3. Dvyadhikādiguṇānām tu, TS., V. 35.

4. Jaghanyaguṇasnigdhānām jaghanyaguṇarūkṣānām ca paraspareṇa bandho na bhavati, TS. Bhā., 5. 33, p. 421.

5. Ityevametau jaghanyaguṇasnigdharūkṣau vihāyānyesām madhyamotkṛṣṭasnigdhānām rūkṣaiḥ snigdhaiśca rūkṣānām paraspareṇa bandho bhavati iti, TS., pp. 421-22; Attrāha-uktām bhavatā—jaghanyaguṇavarjānām (snigdhānām) rūkṣena rūkṣānām ca snigdbhena saha bandho bhavatīti, atha tulyaguṇayoh kimatyantapratिशेदha iti ? atrocye na jaghanyaguṇānāmityadhiकृत्येदमुcyate,

TS. Bhā., p. 422.

or of dryness. In this way there cannot occur a combination of the cohesive ultimate atoms with the cohesive ultimate atoms having equal degree of dryness.¹ The contention of this negation shows that there can be a combination of similar ultimate atoms having unequal degrees of properties—cohesiveness and dryness.² Having abridged the expressed meanings in the third sūtra “Dvyadhikādiguṇānām tu” the position (or limitation) for a combination of unequal quantum of properties of similar constituents has been determined. In accordance with this rule there can take place a combination of similar constituents having unequal degree of property—cohesiveness or dryness, when the property of cohesiveness or of dryness of one constituent element is more than the property of cohesiveness or of dryness of another constituent element by two, three, four units, etc.³ Therefore, if the property of cohesiveness or of dryness of one constituent element is more than the property of cohesiveness or of dryness of the other constituent element by only one unit, then there cannot be a combination of similar constituent elements.⁴

There is no difference in the reading of the aforesaid three sūtras in the Śvetāmbara and Digambara traditions, but

1. Guṇasāmye sati sadṛśānām bandho na bhavati tadyathā—tulyaguṇasnidhasya tulyaguṇasnidhena, tulyaguṇarūkṣasya tulyaguṇarūkṣena iti, TS. Bhā., 5. 34, p. 422.
 2. Atrāha-sadṛśagrahanām kimapeksata iti? atrocyate-guṇavaiṣamye sadṛśānām bandho bhavati, Ibid., p. 423
 3. Dvyadhikādiguṇānām tu sadṛśānām bandho bhavati, TS., p. 424;
- Tadyathā—snigdhasya dviguṇādhikasnigdhena, dviguṇādyadhikasnigdhasya ekaguṇasnidhena, rūkṣasyāpi dviguṇādyadhikarūkṣena, dviguṇādyadhikarūkṣasya ekagunarūkṣena, Ibid.
4. Ekādiguṇādhikayostu sadṛśayorbandho na bhavati atra tu śabdo vyāvṛttivīśeṣanārthaḥ, pratiṣedha vyāvartayati bandham ca viśeṣayati, TS. Bhā., 5. 35, p. 424.

there lies the difference of interpretations made by the commentators. According to the *Bhāṣya* and *Vṛtti* of the *Tattvārthādhigama sūtra*, when both ultimate atoms are having the lowest degrees of energy, then only their combination is ruled out.¹ That is, if one ultimate atom is endowed with minimum quality and another ultimate atom is not possessed of minimum degree of quality, according to the *Bhāṣya*, then there takes place their combination.² But according to the explanation of the Digambara texts—*Sarvārthasiddhi*, etc., there cannot be a combination of one ultimate atom having minimum degree of quality with another ultimate atom³ having non-minimum degree of quality like a mutual combination of two ultimate atoms having the lowest degree of property. “There is no combination between atoms which are characterized by the lowest degree of greasiness or dryness. It as follows: There is no combination of one degree of greasiness with one, two, numerable, innumerable of infinite degrees of greasiness. In the same manner, there is also no combination of one degree of greasiness with one, two numerable, innumerable or infinite degree of dryness. Similarly, it should be understood with regard to one degree of dryness.

If so, it would imply indiscriminate combination among all degrees of greasiness and dryness other than those of the lowest degree.”⁴

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1. Jaghanyaguṇasnigdhanāṁ jaghanyaguṇarūkṣanāṁ, ca parasparena bandho na bhavati, TS. Bhā., p. 421.
 2. Atrāha-uktam bhavatā-jaghanyaguṇavarjānāṁ (snigdhanām) rūkṣenā rūkṣānām ca snigdhenā saha bandho bhavatīti, TS., Bhā., p. 422.
 3. SS., 5. 34 (Comm).
 4. Reality, p. 159.

Teṣām jaghanyaguṇānām nāsti bandhāḥ tadyathā ekaguṇa-snigdhasyaikaguṇasnigdhenā dvyādisaṁkhyeyānantaguṇa-snigdhenā vā nāsti bandhāḥ tasyavaikaguṇasnigdhasya ekaguṇarūkṣenā dvyādisaṁkhyeyāsaṁkhyeyānantaguṇarū-

According to the Bhāṣya and Vṛtti of the Tattvārthādhigama sūtra in all the three sūtras the meaning of the word ‘Ādi’ has been accepted in the sense of three, etc. Therefore, in spite of their being the quantum (aṁśa) of cohesiveness or of dryness of another constituent element more by two, three, four up to countable, countless and infinite units than that of any one constituent element, there will take place a combination in this case. Only if it is more by one unit of property, then there will be no combination. But the Digambara Ācāryas interpret that the combination of ultimate atoms is accepted, if there be only two degree (units) of property more, i. e. like one degree of property in the case of there being three, four up to a numerable innumerable and infinite degrees more, a combination of ultimate atoms is not possible. Ācārya Pūjyapāda explains : “The increase by two units means four degrees of either property (of greasiness or dryness). The particle ‘Ādi’ (etc.) indicates manner. The manner shows increase by two units. By that five degrees, etc., are ruled out. This implies a combination between similar and dissimilar types of atoms if there is difference in degrees of either property by two units. There is no combination of an atom of two degrees of greasiness with one, two or three degrees of greasiness. But there is a combination of it (an atom of two degrees of greasiness) with four degrees of greasiness. The same (greasiness of two degrees), however, does not combine with five, six, seven, eight, numberable innumerable and infinite degrees or greasiness. Similarly, there is a combination of three degrees of greasiness with five degrees of greasiness. But there is no combination of this (greasiness of three degrees) with lesser or greater degrees of greasiness (than two). Greasiness of four degrees combines

kṣena vā nāsti bandhaḥ tathā ekaguṇarūksasyāpi yojyamiti;
Etau jaghanyaguṇasnigdharūkṣau anyeṣāṁ snigdhānām
rūkṣānām ca paraspareṇa bandho bhavati. SS., 5. 34,
(Comm.)

with six degrees of greasiness, but not with the rest. Similarly, it must be understood in other instances. In the same manner, dryness of two degrees does not combine with that of one, two or three degrees. But it combines with dryness of four degrees. The same does not combine with five and higher degrees of dryness. Similarly, it should be understood that there is a combination of dryness of three degrees, etc. with that of two degrees higher than itself. It should be understood similarly with regard to dissimilar types (i. e. greasiness and dryness).” “It is also described in the scriptures”, “with the exception of the lowest degree, wherever there is difference of two degrees in greasiness and dryness, there is combination between similar or dissimilar types, such as greasiness with dryness and greasiness with dryness.”¹

In all the three aforesaid sūtras according to the Bhāṣya and Vṛtti, the rule of combination which takes place because of there being an increase of the degree of properties by two units, three units, etc. is applicable only to similar constituent elements.² But in the explanation of the Digambara Ācāryas that rule is applicable also to the combination of dissimilar ultimate atoms, just as it is applicable to the cause of similar ultimate atoms. “The term sadṛṣā” is intended to indicate combination of the same kind in case there is difference in the degree of greasiness and dryness.

From this it follows that there would be combination between atoms of the same kind and the opposite kind, if there be difference in the degrees of greasiness and dryness.³

1. Reality, pp. 160-161; SS., V. 36 (Comm.)
2. Dvyadhikādiguṇānāṁ tu sadṛṣānāṁ bandho bhavati, TS. Bhā., p. 424.
3. Reality, p. 160;
Guṇavaiśamye sadṛṣānāmapi bandhapratipattyarthān sadṛṣāgrahaṇāṁ kriyate. Ato viśamaguṇānāṁ tulyajātīyānā-matulyajātīyānāṁ ca, SS., V. 35 (Comm), pp. 305-6.

In the process of combination the equal and higher degrees of property transform equal and lower ones respectively.¹ In the case of equal degree of property the combination of similar constituents does not take place, but there occurs the combination of dissimilar constituents, e. g. the combination of two degrees of cohesiveness with two degrees of dryness or three degrees of cohesiveness with three degrees of dryness. In such case, some particular equal degree of property transforms another equal degree of property into its own nature.² That is to say, according to substance, field, time and condition, cohesiveness sometimes transforms dryness into cohesiveness and sometimes dryness also transforms cohesiveness into dryness, having equal degree of property. But in most cases the higher degrees of property can transform the lower ones into their own nature, e. g. the five degrees of cohesiveness, i. e. three degrees of cohesiveness turn into the magnitude of five degrees by the nature of relation. Like this the five degrees of cohesiveness transform the three degrees of dryness into own nature. When dryness is more, then it also transforms cohesiveness of less degree into its own nature.³

According to the Digambara tradition in which the reading is "Bandhe adhikau pāriṇāmikau ca", it is not desirable that

1. Bandhe samādhikau pāriṇāmikau, TS., V. 36.
2. Bandhe sati samagunasya samagunapariṇāmako bhavati adhikaguno hīnasyeti, TS., Bhā., V. 36, p. 426.
3. Sati bandhe—saṅghatālakṣaṇe visrasādvāreṇa tulyaguṇo dviguṇasnidhastulyaguṇastaddviguṇarūkṣasya pariṇāmakah svamatena snehaguṇena rūkṣaguṇamātmasātkaroti, evam rūkṣaguṇah kadācit pariṇāmakah, svagatena rūkṣaguṇena snehaguṇamātmasātkaroti pariṇāmayatīti, gunasāmye tu sadṛśānām bandhapratिशेदhah, imau tu visadṛśāveko dviguṇasnidhho anyo dviguṇarūksah, sneharūkṣayośca bhinnajātīyatvānnāsti sādṛśyam, tathā adhikaguṇah—triguṇasnidhho hīnaguṇasya ekaguṇasnidhasya pariṇāmayitā, anena hyekaguṇasnidhastriguṇasnidhhatāmāpadyate, TS., pp. 426-27.

one equal degree of property transforms another equal of property into its own nature. But it avers that in the process of combination the higher degrees transform the lower ones.¹ For example, "treacle full of sweetness transforms particles of dust, etc., that surround it, by imparting its sweetness to them. Similarly, higher degrees transform lower degrees. So greasiness and dryness of four degrees, etc., transform greasiness and dryness of two degrees. For that reason the previous state disappears and another state of four degrees is manifested. Thus combination (oneness) is produced. Otherwise the two would appear separate in spite of union, as in the case of a cloth woven with black and white yarn."²

COMBINATION AND SEPARATION OF ULTIMATE ATOMS AND MOLECULES

In the Jaina Āgama Bhagavatī Vyākhyāprajñāpti a detailed account of combination and separation of ultimate atoms and molecules having two units up to infinite units (pradeśas) has been given in a systematic way. As for example, two ultimate atoms combine together because of their property of cohesiveness (force of attraction); they may disintegrate into two discrete units (atoms) by the process of disintegration (i. e. by the force of repulsion); thus they become individual discrete ultimate atoms again.³ In this way three ultimate atoms com-

1. Bandhe adhikau pāriṇāmikau ca, SS., V. 37.

2. Reality, p. 161;

Yathā kliano guḍo' adhikamadhurarasah pariṭānāṁ reṇvā-
dīnāṁ svaguṇotpādanāt pariṇāmikāḥ, tathā'anyo'pya-
dhikaguṇāḥ alpiyasah pariṇāmika iti kṛtvā, dviguṇādisnig-
dharūkṣasya caturguṇādisnigdharūkṣah pariṇāmiko bhavati
tataḥ pūrvāvasthāpracyavanapūrvakāṁ tārīyikamavasthā-
ntaram prādurbhavatītyekatvamupapadyate. itarathā hi
śuklakṛṣṇatantuvaṭ samyoge satyasyapariṇāmikatvātsarvāṁ
viviktarūpeṇaivāvatistheta, SS., 5.27 (Comm).

3. BhS., I. 10. 80.

bine together because of their cohesiveness (force of attraction) into a molecule. If that aggregate disintegrates into two parts, the one part becomes an ultimate atom on the one side and the other part becomes an aggregate having two units. If it disintegrates into three parts, there become three discrete ultimate atoms. Similarly, four and five atoms combine together to form aggregates and those aggregates are non-permanent, for the process of integration and disintegration always takes place in them.¹ In this manner the account of combination and separation of infinite ultimate atoms has been discussed in great detail.

Infinite ultimate atoms integrate into one molecule having infinite units (pradeśas). On its disintegration it gets divided into two, three up to ten, countable, countless and infinite units. When disintegrating into two parts, the one part becomes one discrete ultimate atom by singleness and the other one becomes an aggregate having infinite units or two aggregates having infinite units. When disintegrating into three parts, there become two discrete ultimate atoms by singleness and one aggregate having infinite units or there become one ultimate atom by singleness, one dyad and one aggregate having infinite units up to or there become one ultimate atom by singleness, one aggregate having countless units and one aggregate having infinite units or there become one ultimate atom by singleness, two aggregates having infinite units or there become one dyad and two aggregates having infinite units—thus up to or there become by oneness one aggregate having ten units and two aggregates having infinite units or there become an aggregate having countable units by oneness and two aggregates having infinite units or there become by oneness one aggregate having countless units and two aggregates having infinite units or there become three aggregates having infinite units. While disintegrating into four parts, there become by singleness three ultimate atoms and one aggregate having infinite units; thus catuskasaṁyoga up to

1. Bhs., 1. 10 80.

asāmūkhyātasāmyoga should be understood; all these are discussed like the account of countless divisions as stated above. Similarly, the account of infinite divisions also should be known. Only difference is that one infinite division (anantaka) more should be stated up to or there become by oneness countable aggregates having countable units and an aggregate having infinite units, or there become countable aggregates having countless units and an aggregate having infinite units or there become countable aggregates having infinite units. When disintegrating into countless parts, there become countless ultimate atoms and an aggregate having infinite units or there become countless aggregates having countless units and one aggregate having infinite units or there become countless aggregates having infinite units. When disintegrating into infinite parts, there become infinite discrete ultimate atoms.¹

PUDGALAPARIVARTTA (ASSEMBLING TOGETHER OF ULTIMATE ATOMS WITH MATERIAL SUBSTANCES)²

As a result of integration and disintegration of ultimate atoms there can follow infinitefold pudgalaparivarttas of paramāṇus³ (union of ultimate atoms with material substances). There are stated to be seven kinds of pudgala-parivartta, viz. audārika-pudgalaparivarttas (assemblings of gross matters), vaikriya-pudgala-parivarttas (assemblings of trans-

1. BhS., 12. 4. 445.

2. Pudgalaiḥ pudgaladravyaiḥ saha parivarttāḥ—paramāṇūnāṁ milanāni pudgalaparivarttāḥ samanugantavyāḥ abugantavyā bhavanti iti hotoḥ akhyotāḥ parūpitāḥ bhagavadbhiriti gamyate makarśa—prakṛīśāitīprabhavaḥ, BhS., 12. 4. 446 (Comm).

3. Hamtā Goyamā ! essi nām paramāṇupoggalāṇam sāhanānābhedaṇuvāṇam aṇamītāṇam poggalapariyatāṇam aṇamītāṇamta-poggalapariyatāṇam samanugamītavā bhavam-Iti makkhāyā, Ibid., 12. 4. 446.

formable matters), taijasa-pudgala-parivarttas (assemblings of luminous matters), kārmaṇa-pudgala-parivarttas (assemblings of karmic matters), manahpudgala-parivarttas (assemblings of mental particles or mind-dusts), vāk-pudgala-parivarttas (assemblings of speech-matters) and ānaprāṇa-pudgala-parivarttas (assemblings of respiration-matters).¹

Taijasa and kārmaṇa-pudgalaparivarttas are eguttariyā (one or two or three in the minimum or countable up to infinite in the maximum) in all cases; manahpudgalaparivarttas are eguttariyā in all five-sensed beings but there is none in the case vikalendriyajīvas (two-sensed up to four-sensed beings), vāk-pudgala-parivarttas are thus and the same; the particular difference is this that it is not applicable in the case of one-sensed beings. Ānaprāṇa-pudgala-parivarttas take place in all cases of five-sensed beings up to that of the vaimānikas² (celestial beings).

Audārika-pudgala-parivarttas occur because audārikaśarīra-prayogadravyas (material substances applied by the gross body) in the form of audārikaśarīra (gross physical body) are received, bound, pervaded, transformed, held, settled, immersed, attained and developed by soul, existing in the gross physical body and in the forms of limbs and they are transformed, dissociated, discharged and given up by it. Similarly, vaikriya-pudgala-parivarttas (assembling together of the transformable matter) also should be understood. The particular difference is this that it should be stated that it is received by soul existing in vaikriyaśarīra (transformable body).

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1. Goyamā ! sattavihe poggalapariyatte pañnatte, tamjabā-orāliya-poggalapariyatte veuvviya teyapoggalapariyatte kammāpoggalapariyatte manapoggalapariyatte vaipoggalapariyatte ānāpānu-poggalapariyatte, Ibid.
 2. BhS., 12. 4. 446; 'Eguttariyā' means one or two or three in the minimum or countable up to infinite in the maximum. Another meaning is 'Having one as the latter part (in the case of compound numerals).'

The remaining account is one and the same; all up to ānaprāṇapudgala-parivartta should thus be known. The particular difference is that all ānaprāṇa-pudgala-prayoga-sarvadravyas (all material substances applied by respiration) are assembled together as ānaprāṇa-pudgala (respiration-matter). The remaining is one and the same as before.

Audārika-pudgala-parivartta becomes free by the cycle of utsarpinī and avasarpinī kālas. Similarly, vaikriya-pudgala-parivartta up to ānaprāṇa-pudgala-parivartta also should be known.

Of those audārika-pudgala-parivarttanirvarttanakāla (time for being free) upto ānaprāṇapudgala-parivarttanirvarttanakāla, the least of all is kārmaṇa-pudgala-parivartta-nirvarttanakāla, taijasa-pudgala-parivartta-nirvarttanakāla in infinite times more than kārmaṇa-pudgala-parivartta-nirvarttanakāla, audārika-pudgala-parivartta-nirvarttanakāla is infinite times more than audārika-pudgala-parivartta-nirvarttanakāla, manah-pudgala-parivartta-nirvarttanakāla is infinite times more than ānaprāṇa-pudgala-parivartta-nirvarttanakāla; vāk-pudgala-parivartta-nirvarttanakāla is infinite times more than manah-pudgala-parivartta-nirvarttanakāla; and vaikriya-pudgala-parivartta-nirvarttanakāla is infinite times more than vāk-pudgala-parivartta-nirvarttanakāla. Of these audārika-pudgala-parivartta up to ānaprāṇa-pudgala-parivarttas, the least of all are vaikriya-pudgala parivarttas; vāk-pudgala-parivarttas are infinite times more than vaikriya-pudgala-parivarttas; manah-pudgala-parivarttas are infinite times more than vāk-pudgala-parivarttas; ānaprāṇa-pudgala-parivarttas are infinite times more than manah-pudgala-parivarttas; audārika-pudgala-parivarttas are infinite times more than ānaprāṇa-pudgala-parivarttas; taijasa-pudgala-parivarttas are infinite times more than audārika-pudgala; taijasa-pudgala-parivarttas are infinite times more than audārika-pudgala-parivarttas and kārmaṇa-pudgala-parivarttas.¹ This account of pudgalaparivarttas (assembling

1. BhS., 12. 4 447.

together or joining of ultimate atoms with material substances) throws light upon the complex system of the combination of Matter with regard to all beings from different aspects, such as, time, etc.

THE SĀMKHYA VIEW ON THE COMBINATION OF MATTER

According to the Sāmkhya, the process of combination of different elements of Matter is explained in the following manner : there are stated to be two classes of aggregates, viz. (1) those of which the parts are closely united and fused, being lost in the whole (ayutasiddhāvayavāḥ) and mechanical aggregates or collocations of distinct and independent parts (yutasi-dbhāvayavāḥ samūhāḥ).

As an aggregate of the first kind a substance may be classified into two groups, viz. the Bhūtas and their 'isomeric' modifications (bhūtabheda and bhūtavikāra) and chemical compounds (militadravya saṃhatabhūtartha). The second class of the substance may be sub-divided into two group, viz. (i) those compounds of atoms of the Bhūta class, i. e. of different isomeric modification of the same Bhūta, and (ii) those compounds of atoms of different Bhūta classes. In the former there takes place the contact between 'isomeric' atoms (sajātīya-saṃyoga), while in the latter there occurs the contact between heterogeneous atoms (vijātīya-saṃyoga). The first contact brings about the intimate combination.¹ "The isomeric atoms by a peculiar liberation of energy (sajātīyopastambha—the action of similars on similars) are attracted towards one another, and being riveted as it were, form the so-called material cause (upādānakāraṇa) of the compound product.²

1. Saṅgah saṅgākhyāḥ yaḥ saṃyogaviśeṣaḥ tenaiva dravyā-
ṇām vikāro bhavati, Pravacanabhāṣya, p. 136,

Vijñānabhiksū;

See The Positive Science of the Ancient Hindus, p. 49.

2. P. S. A. H., p. 49.

The second kind of contact (that between unlike atoms of heterogeneous Bhūtas) begins with a liberation of Energy (*upastambha*), which breaks up each of the Bhūtas; and taking particles (or atoms) of one as nuclei or radicles, groups particles of the rest round these radicles in a comparatively free or unattached conditions".¹

This Sāmkhya process of combination of atoms is comparable to the Jaina view that "there would be combination between atoms of the same kind and the opposite kinds, if there be difference in the degrees of greasiness and dryness."²

In the above process the one Bhūta performing the function of providing the radicles is called *upādāna-kāraṇa* (material cause), while the others bringing about the release of Energy by their collocation (*upastambha*, *avaṣṭambha* or *viṣṭambha*) are known as *nimittakāraṇa* (efficient cause)³. It is demonstrated by the examples of the Rasas as modifications of Ap (water) with earth-accretions that this process applies to the attributes (*gunas*) and the Bhūtas.⁴

1. P. S. A. H., p. 49.

2. Reality, p. 160, SS., (Comm), V. 35.

3. Evamekaikaguṇasambhavat̄ pradhānaguṇam̄ āśritya apra-dhānaguṇāḥ pariṇāmabhedān̄ pravarttayanti, Vācaspati, Sāmkhyatattvakaumudi on kārikā, 15, Vide P. S. A. H., p. 50.

4. Yathā ākāśādekarasaṁ salilāṁ patitāṁ nānārūpāt̄ samśleṣāt bhidyate, Gaudapāda on kārikā, 17, Vide P. S. A. H. p. 50.

Tatra'api (taijase śarīre api) bahutarapārthivāvayavāvaṣṭambhāt, alpatve ca anupabhogāt; Aniruddha on Sūtra 112, Chap. V.

Jātiśāmkaryasya asmākamadogaśatvāt̄ sāmagṛīsamavadhāne anekairapi indriyaiḥ ekadā ekavṛttiyutpādane bādhakām nāsti; Sāmkhya Pravacanabhāṣya, Vide P. S. A. H., p. 50.

According to Aniruddha, "both 'isomeric' and 'heterogeneous' combinations are real causes of constitutive contact.¹ "But in the later Sāṃkhya-Pātañjala the current teaching denied this—'bahūnāmupādānayogat' (Sūtra 102, Chap. V), where Vijñānabhikṣu notes—bahūnām bhinnajātīyānām copādānatvam na dṛṣṭamiti sajātīyamevopādānām itarācca bhūtacatuṣṭayamu-paṣṭambhakam".²

It is admitted by the Sāṃkhya that the dyad (dvyaṇuka) may be formed by atoms in constituting substances.³ In the mediaeval Sāṃkhya-Patañjala it was conceived under the influence of the Nyāya-Vaiśeṣika that the intimate combination took place in the case of the structure of molecule formed of 'isomeric' atoms, while in the case of a molecule formed of heterogeneous atoms there occurred only grouping of comparatively free or loosely attached atoms round a radicle atom (vyūhana) with liberation of Energy (upastambha, avaṣṭambha or viṣṭambha) and the setting up of unequal stress and strain (guṇavaiṣamyavimardda—Īśvarakṛṣṇa). There existed a fundamental (radical) difference between these two structures of molecules. But this distinction is not applicable to the Tanmātras (infra-atomic potentials or sūkṣma-bhūtās), the forms of subtle matter which could combine into close "fusion whether homogeneous or heterogeneous". As for instance, sūkṣmaśarīra (subtle body), the vehicle of the sentient principle is admitted by Vijñānabhikṣu to be pañca-bhūtātmaka (penta-Bhautika), i. e. all the five infra-atomic potentials (Tanmātras) function as upādānakāraṇas (material causes). "though the gross body (the animal organism) is stated

1. Ārambhakasamyoga, e. g. bhautika-vāyordehārambhakatvam, Aniruddha on sūtra 113, Chap. V., Vide P. S. A., H., p. 50.
 2. The Positive Sciences of the Ancient Hindus, p. 50.
 3. Tathā anyonyāśrayāśca dvyaṇukavat guṇāḥ, Gauḍapāda on kārikā 12;
- The Positive Sciences of the Ancient Hindus, p. 52.

to be a "heterogenic" compound with the Earth-Bhūta as radical or base.¹ But according to the original Sāṃkhya-Pātañjala, the production of a new substance by the contact of dissimilar elements (vijātīyasamyoga) was admitted "as freely as in Vedānta, and was conceived as in nowise differing from the formation of a compound of atoms of the same Bhūta class".²

The Sāṃkhya view of chemico-physical action does not make any distinction between 'collocations of isomeric' and 'those of heterogeneous atoms', as basically they are all collocations of the Guṇas; even it is urged by Vijñānabhikṣu that "the qualities of a compound substance are not necessarily the result of similar qualities in the compound elements."³

THE NYĀYA-VAIŚEṢIKA VIEW ON THE COMBINATION OF MATTER

According to the Nyāya-Vaiśeṣika Philosophy, the ultimate atoms cannot exist in discrete state in creation;⁴ nevertheless, the atmospheric air consists of the means of atoms in a loose uncombined state.⁵ One earth-atoms combines with another

1. The Positive Sciences of the Ancient Hindus, p. 53;
Adhiṣṭhānaśarīraṁ ca sūkṣmaṁ pañcabhūtātmakam vaks-yate, tanmātrakāryam yat bhūtapañcakam liṅgādhīṣṭhānam śarīraṁ—Sāṃkhya Pravacanabhaśya, sūtra 11 and 12, Chap. III. Sthūlaśarīraṁ pārthivameva anyāni ca bhūtāni upaṣṭambhakāni, Ibid., 19, chap. III.
2. The Positive Sciences of the Ancient Hindus, p. 54.
3. Ibid.;
- Sajātīyakāraṇaguṇasyaiva kāryaguṇārambhakatā iti tu tesām (tārkikānām) api na niyamah, vide P.S. A. H., p. 54.
4. Śivāditya, Saptapadārthī, vide commentary.
5. Stimitavāyustu paramāṇusamūha eva anārabdhadravyah, Saptapadārthī, p. 21.

by an original tendency to form a dyad (dvyaṇuka). In the same manner the dyads of other elements of Matter are constituted. The ultimate atoms are endowed with inherent vibration (parispandana) and it is the rule that while combining in pairs except in the case of the chemical action under the influence of heat, the original qualities of the ultimate atoms generate homogeneous qualities in the dyads.¹

In the orthodox view, the primordial infinitesimal atoms begin with an unceasing vibratory motion² and an inherent impulse which leads them to combine into dyad. The dyads constitute larger molecules, having combined by threes, fours, fives, etc. and the variety of elementary substances. The particular arrangement of them is determined by the physical causes as well as by the unseen force (Adṛṣṭa).³

It appears that this view has been originated by Praśastapāda.⁴ According to another view maintained by the Vaiśeṣika

1. Kāryaguṇam kāraṇagunapūrvakam, VS., 7. 1. 6.
2. Anavarataparispandamānā parimitapavanādiparamāṇavah, Raghunātha Śiromāni, Vide P. S. A. H., p. 100; Gatiślatvāt patatravyapadeśāḥ patantīti, Nyāya Kusumāñjali, Udayana, Vide P. S. A. H., p. 100.
3. Dvyaṇukairbahubhirārabhyate ityapi niyamo na, dvābh्याम् tasyāṇuparimāṇotpattau kāraṇasadbhāvenāṇutvotapattāvārambhavaiyarthyāt, bahuśu tvaniyamah, kadācit tribhirārabhyate iti tryaṇukamityucyate, kadāciccaturbhirārabhyate, kadācit pañcabhiriti yathेषां kalpanā ..adṛṣṭavaśāt tathā tathā teṣām vyūho yathā yathā tadārabhesu aparajātayo vyajyante, nanvadṛṣṭakāriṭā sarvabhāvānāṁ srstih, NK., Pr̥thivīnirūpaṇam, pp. 80-81;
Cf. Vācaspati's Report, Bhāmatī, chap. II, pāda II, sūtra 2;
- Yadā caturaṇukamārabhate caturṇām dvyaṇukānāmārambhakatvāt.
4. Paramāṇudvyaṇukeśu bahutvasamkhyā tairārabdhe kāryadravye tryaṇukādilakṣaṇe, PPBhā., Parimāṇanirūpaṇam, p. 57.

system, ultimate atoms possess an inherent tendency to combine with one another, but some combine in pairs, others in triads, others in tetrads, etc., either by ultimate atoms falling into the groups of threes, fours, etc., direct, or by the successive addition of one atom to each preceding aggregate. The latter process of combination by the successive addition of one atom to each preceding aggregate is similar to the Jaina view of the formation of dvipradeśika—, tripradeśikaskandha, etc. Therefore, like the Jaina tripradeśikaskandha the Vaiśeṣika tryaṇuka inheres in three atoms, but not in three dyāṇikas (dyads). Similarly, the same process of combination of atoms follows in the case of tetrads, pentads, etc.¹

According to Praśastapādabhāṣya, the dyads are combined by threes, fours, fives, etc. (tryaṇuka, caturaṇuka) to constitute different isomeric modifications. "The variety of Earth-substances is due to differences in the arrangements of the molecules (e. g. their greater or less density, and above all, their grouping or collocation, vyūha, avayavasanniveśa), which account for the specific characters (aparajāti) manifested by these isomeric substances."²

1. Caturvidhāḥ paramāṇavaḥ kṣitijalāgnivāyunāṁ, dvābhyaṁ paramāṇubhyāṁ dyāṇukamārabhyate tribhiḥ paramāṇubhistryaṇukamārabhyate iti kramena sthūlakāryadravyasyotpattiḥ, Utpala, Chapter I, Sloka 7;
Vṛhatsaṁhitā, cf. also Śrīdhara's admission, "Athavā yadi paramāṇavo dyāṇukamārabhya tatsahitāstryaṇukamārabhante tryaṇukasahitāstu dravyāntram tathāpi, kuta viśvasya agrahaṇām, Vide P. S. A. H., p. 101; see yadāpi dve dyāṇuke caturaṇukamārebhetā, ŚBhā., (Sarīrakabhāṣya), II. XX. 2, see P. S. A. H., p. 101.
2. amāṇajātīyasamyogaḥ dravyārambhakaḥ na vijātīyasamyogaḥ, Vide P. S. A. H., p. 98;
Sā pṛthivī sthairyādyavayavasanniveśaviśiṣṭā aparajāti-bahutvopetā, PPBhā., Pṛthivīnirūpaṇām, p. 12;
Sthairyānūni vidiatvām ādiśabdāt praśithilatvādiparigrahaḥ

As already discussed in the previous chapter, an elementary substance like earth produced by primary atomic combination may undergo qualitative change under the action of heat in a furnace, according to two theories, viz. Pīlupāka (chemical action of isolated atom) of the Vaiśeṣikas and Pīṭhara pāka (chemical action of the composite structure) of the Naiyāyikas, i. e. (1) the decomposition into homogeneous atoms, transformation of atomic qualities and finally recombination, all under the operation of heat and (2) the assuming of new characters by the molecules and larger aggregates under the influence of heat without decomposition into homogeneous atoms or change of atomic characters.¹

paramāṇvādiṣu aparajātyabhāve api adṛṣṭavaśāt tathā tathā teṣāṁ vyūhah yathā yathā tadārabdheṣu aparajātayo vyajyante, NK., Pṛthivīnirūpaṇam, p. 81;

Sthairyaṁ sthiratā cirakālāvasthāyitvamiti yāvat. Ādigrahanādvīṣṭambhakatvam jalādivyūhavirodhitvañca avaya-vasanniveśāḥ tattatsāmānyaviśeṣābhivyañjakasamṛsthāo-a-višeṣāḥ, na etaddravyāntare saṁbhavati, jalādināṁ yatkīñcit sparśavad-vegavad-dravyopanipātamātreṇaiva bhaṅgu-ratvāt, K. V. Ibid. (Pṛthivīnirūpaṇam).

1. Teṣāmanumānena vināśāḥ parikalpyate. Sarvāvayavesu antarbahiśca pākapūrbbakapūrbbarūpādivilakṣaṇaguṇopalabdherantahpraveśāḥ kṛṣāṇorānumāṇyate tena vegavatā banhidravyeṇa nodanāt abhighātāt vā nyūnam ghaṭādyā-rambhakeṣu avayavesu kriyā jāyate kriyāto vibhāgah vibhāgāt dravyārambhakasamṛthyogavināśāḥ, tadvināśāt dravyavināśāḥ, pakkāśca śyāmādiguṇānavajahataḥ raktāśigunāntarayogamanubhavantah—adṛṣṭapreryamānāḥ parasparam saṁyujya dvyaṇukādiprakrameṇa tāḍṛśameva ghaṭādikāryamārabhante, evam tapanātapadṛśyamānēsu āmrādiphaleṣu esa eva nyāyah, śāstre, api udaryeṇa tejasā pacyamānēsu annapānādiṣu rasamaladhātubhāvena pariṇāmamupagacchatsu prāyeṇa pratikṣaṇamutpādavināśau sambhavata iti, NM. (Bhūta-caitanyaपूर्ववापक्ष), Vide P. S. A. H., p. 102;

THE BUDDHIST VIEW ON THE COMBINATION OF MATTER

In the Buddhist Philosophy the process of combination and dissociation of particles of matters are not clearly dealt with as is treated in other Indian systems of thought. Nevertheless, it is implied from the Buddhist conception of saṅghātapaṇamāṇus (combined atoms) like saptadravyaka, aṣṭadravyaka, navadravyaka and daśadravyaka, and kalāpa that the atoms of earth, water, fire and air and the atoms of colour and shape, sound, odour, taste and tangible cannot "appear independently without being combined with the fundamental ones, in the ratio of four atoms of primary matter to one of secondary."¹ So the minimum number of four atoms of general materiality integrated with each atoms of colour, odour, taste and secondary tangibility—matter is necessary "for their actual appearance in life."² In the case of particular piece of matter resounded, atoms of sound being added to it make the combination

Prakṛtisūśiratayaiva kāryadravyasya ghaṭādeḥ ārambhāt
antastejaḥ kaṇānupraveśakṛtapākopapatteḥ alām vināśakal-
panayā, piṭharapākapakṣa eva peṣalah, NM., (Bhūta-Cai-
tanya-Pūrvvapakṣa);

Ye bijāvayavāste pūrbbavyūhaparityāgena vyūhāntaramā-
padyante vyūhāntarāpattu ca pr̄thividhāturabdhātunā
saṁgr̄hīta'ntareṇa tejasā pacyamāno rasadravyam nirvar-
itayati sa rasah pūrbbāvayasahito' ankurādibhāvamāpa-
dyate, paramāṇavavasthāni bijāni bhavanti iti etanna
pratipadyamāne, yasmācchālyādibijamucchūnavasthāmādiṁ
kṛtvā yāvadupātyam śālibijakāryam tāvanna kadācit
paramāṇavavastham bhavati, yadi tu syāt kadācit nopala-
bhyeta, Udyotakara, chap. III, Āhnika, I, Su. 4, Vide
P. S. A. H., p. 103.

1. The Central Conception of Buddhism, p. 12.

2. *bid.*

comprising nine different atoms.¹ "The combined atoms (*samghāta-paramāṇu*) alone appear in phenomenal reality, the simple ones, or infra-atomic elements, presumably, were relegated to the transcendental reality, in accordance with the general character of a Buddhist element. This device made it an easy task for the Buddhists to oppose indivisibility of atoms."²

According to the later *Vaibhāṣikas*, air-atoms form air by aggregation, fire-atoms constitute fire by aggregation, water-atoms form water by aggregation and earth-atoms form earth by aggregation. The elements combine to constitute inorganic substances, organism and organs.³

In the physical sciences the combination of Matter is explained in this way that atoms are capable of free existence. "Every atom exerts a force upon every other atom."⁴ They combine with other atoms and form molecules by the force of attraction "when the atoms are at a distance apart greater than their normal diameters, changing to a force of repulsion if the atoms are forced very close together. Thus there will be a tendency for atoms, because of their force of attraction to draw together and stick."⁵ That is to say, the atoms of one substance combine with those of another to form molecules in the process of chemical reactions taking place between two substances. The molecules constituting a substance attract each other by the inter-molecular forces of attraction. This force of attraction between them is very strong when the distance between

1. The actual number of atoms in a *samghātāparamāṇu* will be much greater, since each atom of secondary (*bhautika*) matter needs a set of four primary atoms of its own, but if *dhātu*s alone are reckoned, the number will express the classes (*dhātu*) of elements (*dharma*s) represented (cf. Ab. K. ii. 2), *Ibid.*

2. *Ibid.*

3. P. S. A. H., pp. 92-93.

4. Atoms and the Universe, p. 126.

5. *Ibid.*

them is small. It vanishes when the distance exceeds the range of molecular attraction, i.e. there is the repulsive force. "If there are no such repulsive forces, atoms would not have individual existence and would all merge into each other. So the very existence of discrete atoms is a *de facto* demonstration of the existence of repulsion. But we can see, a possible origin of this force in the structure of the atom as a positively charged nucleus surrounded by a cloud of negative electrons. If we consider two such atoms approaching so closely together that they overlap greatly (assuming for the purposes of this argument that this does not cause any distortion of the individual atoms) we eventually arrive at a condition in which the two are very close together, and the two spherical electronic clouds have become nearly coincident. It is obvious that the most important force under these circumstances will be the repulsion of the two positively charged nuclei upon each other, because the electronic clouds will so thoroughly mixed up that their contributions will act almost equally on both nuclei. At small distances the repulsion of nuclei becomes very powerful and this is, in part at least, the origin of the general repulsive force between atoms."¹

The molecules also tend to dissociate from each other by an inherent motion to which they are subject. They are subject to the simultaneous action of two forces--the intermolecular forces of attraction tending to combine them into a compact mass, while the inherent molecular motions tend to spread them out.

Snigdhatva (cohesiveness) and *rūksatva* (dryness) of Matter conceived in Jaina Philosophy may correspond to the force of attraction and the force of repulsion respectively as inherent properties in Matter of the physical sciences. As the attractive and repulsive forces are most indispensable for the combination and separation of atoms and the molecules in the physical sciences, so also *snigdhatva* (cohesiveness) and *rūksatva* (dry-

L. Atoms and the Universe, p. 128,

ness) are main properties of Matter for the combination and dissociation of atoms and aggregates of atoms, according to Jaina metaphysics. Thus the Jaina conception of the combination of Matter runs parallel to the conception of molecular formation of the physical sciences, though they differ in regard to the complex process of chemical behaviour of matters.

CONCLUSION

Value of the Jaina Conception of Matter

A study of the Jaina conception of Matter reveals that it was natural for the Jainācāryas to begin their metaphysical inquiry to the problem with the notion of Dravya (substance), a notion which has a continuous history in Jaina Philosophy from its very beginning up to the present time as is found in the case of notion of substance from Aristotle to Descartes. The Jainas had developed the distinction between Dravya and its gunas (attributes) partly in order to mark logical difference between the ultimate subjects of knowledge and partly also to answer puzzles about change and identity.

The next step is to divide gunas of Dravya or gunas which it may be said to possess into two categories : first, the essential attributes, those which make it the kind of thing it is, and secondly, the accidental attributes, which it may acquire and lose without changing its essential nature.¹ "In Spinoza's terminology the words 'necessary and contingent' are generally substituted for 'essential and accidental.'"²

The Jaina concept of Dravya is comparable with the concept of substance of Spinoza, the central theme of his metaphysics. "A substance, all of whose attributes and modifications can be deduced from its own essential nature, and all whose attributes are therefore necessary and not contingent, can be described as cause of itself, (*causa sui*) and only such a substance can be so described. It is Spinoza's fundamental argument in part I of

1. Sarvārthaśiddhi, Pūjyapāda, p. 136;

Tattvārtha Rājavārtika, p. 502;

Tattvārtha Ślokavārtika, ch. V. 41, p. 446;

TS., Bhā, Ch. V, p. 435.

2. Spinoza, Stuart Hampshire, A Pelican Book, p. 32.

the Ethics that there can be only one substance which is causa sui, and that this single substance must be identified with the universe conceived as a whole, this unique all-inclusive totality he therefore calls God or Nature (Deus sive Natura).”¹

Spinoza has so strictly defined substance that “nothing whose attributes are the effects of outside causes can be called a substance; a substance by definition is such that all its attributes or modifications, can be explained in terms of its own nature and are therefore necessary and not contingent.”²

According to Spinoza, “There can be only one substance so defined, and nothing can exist independently of or distinct from, this single substance; every thing which exists must be conceived as an attribute or modification of or as in some way inherent in, this single substance; this substance is therefore to be identified with Nature Conceived as a whole or as the totality of things. This substance must be infinite in its nature “...it possesses an infinite number of attributes each of which is itself infinite.”³

The Jaina Concept of a single Dravya is a unique all-inclusive totality like the single substance of Spinoza, identified with the universe conceived as a whole. That which has gunas (qualities) and paryāyas (modifications) is a Dravya (Substance).⁴ Dravya is the inherent essence of all things, manifesting itself in and through infinite modifications, and it is endowed with qualities and it reveals permanence and change inherent in it to be real.⁵ And Dravya is endowed with its unchanging nature of existence.⁶ It possesses an infi-

1. Spinoza, Stuart Hampshire, A Pelican Book, p. 36.

2. Ibid., p. 38.

3. Ibid., pp. 38-39.

4. TS., ch. V. 37, p. 427.

5. PS., 8.

6. Pravacanasāra, Pt. II, 3, p. 123.

nite number of attributes each of which is itself infinite like that of the single substance of Spinoza.

The Jainas made the metaphysical inquiry into the concept of Dravya from the noumenal and phenomenal points of view with the doctrine of manifoldness. Dravya has been conceived by them as the principle of Reality from the aspect of generality, while its particular characteristics are Jīvadravya (sentient principle or living substance) and Ajīvadravya (non-sentient principle or non-living substance) from the particular aspect.¹ But Jīvādravya and Ajīvādravya do not form any two-substance doctrine, representing the world of animated things and the world of non animated things as independent and self-contained systems. According to a similar concept of "a unique substance of Spinoza", thinking substance and extended substance are one and the same substance, comprehended now under this attribute, now under that."²

Jaina Philosophy has conceived six categories of Dravya (Substance) as determined by their respective natures, viz. Dharma (Principle of Motion), Adharma (Principle of Rest), Ākāśa (Space), Jīva (Soul), Pudgala (Matter) and Addhāsāmaya³ (Time).

Matter is conceived by every system of Indian philosophy in its own perspective. The Jaina concept of Matter comes nearer to the concept of Matter of the physical sciences in some respects, as it is conceived as the substance in the sense of stuff of which the universe is constituted. It is one of the ultimate principles or substances of which phenomena are manifestations.

An analysis of the nature of Jaina Pudgala (Matter) reveals that it is a permanent, non-living, extensive, physical, corporeal and concrete, active, disintegrating and integrating, and

1. Anuyogadvāra Sūtra, 123.

2. Spinoza, p. 64.

3. BhS., 25. 4. 733-4.

changeable substance. It is infinite in number, co-extensive with the cosmic universe, possessed of the capacity to be received by Soul and to be assistance to it. It is characterized by origination, decay and permanence without giving up its essential nature of existence.

The main features of the nature of Jaina Pudgala (Matter) except grahanaguna (capacity to be received by Soul) are similar to those of the nature of Matter conceived in the physical sciences to a considerable extent.

Jaina Pudgala represents the elements of Matter, Earth, Water, shadow, objects of four senses, karmic matter and atom form the whole material universe in the grossest to the finest forms. The most valuable point in this conception of the elements of Matter is that each of its effect, when studied, is ultimately found to have been constituted of one or more of these elementary particles. The Jaina conception of the elements of Matter appears to be unique in its originality, for it has accepted not only earth, water, fire and air, etc. as the basic elements of Matter, but it has given place to indriya (sense-organ), karmic matter and leśyā (condition of soul) as material elements in its fold on the basis of psycho-physical aspects of the material substance. The value of the Jaina conception of the basic elements of Matter, such as, sulphur, iron, copper, tin, mercury, lead, silver, gold, etc. lies in the fact that the Jainācāryas conceived the idea of pure elements of Matter as distinguished from the base forms of it.

On the emergence of the Jaina and other Indian concepts of atomicity of Matter from the first chemical and physical observation it came to light that ultimate particles were much smaller than the samples of matter. They are inapprehensible to the senses and their existence is inferable. It appears that Jaina Metaphysics commenced with the conception of the grossest form of Matter and entered into its subtle form by stages in dealing with the problem of the elements of Matter.

Four general properties of Matter colour, taste, smell and touch, its impenetrability, cohesion, adhesion, greasiness (*snigdhatva*=attractive force) and roughness (*rūkṣatva*=repulsive force), oscillation or vibration and motion are the common properties of Matter to both Jaina Metaphysics and physics.

The Jaina conception of the effects of Matter as earth, water, fire, air, vegetation, body, speech, mind and respiration and its manifestations as sound, combination, fineness, grossness, shape, division, darkness, shadow, heat and light is old in Indian Philosophy. All these effects and manifestations of Matter except 'shadow' have been accepted in the physical sciences in some forms.

The classification of Matter by the Jainas into one group to infinite groups from various points of view are valuable in an analysis of Matter in the light of the physical sciences.

The Jaina theory of transformation of Matter as a result of internal and external causes, propounded on the basis of various aspects, such as quality, etc. is a valuable contribution to the Indian concepts of transformation of Matter. Besides the Jaina concept of its transformation brought about by the processes of integration, disintegration and integration-cum-disintegration is identical with the theory of chemical behaviour of atoms and molecules as explained in the physical sciences. The process of the combination of Matter as explained in Jaina metaphysics on the basis of certain principles of interactions between atoms which give rise to the existence and behaviour of matter in bulk bears some points of similarity with that of the physical sciences regarding inter-atomic forces and the combination of atoms.

The greatest value of the Jaina conception of Matter lies in the fact the reality of Matter, with its noumenal and phenomenal aspect, has amply and brilliantly been expressed together with its potent factors—origination, decay and permanence from the points of view of substance, locus, time and condition

in the daring speculation, not sacrificing the logical aspect of knowledge in the thoughts of its metaphysical and physical existence and in the synthetic views of its qualities and modifications, elements, karma, atomism, properties, effects and manifestations, classifications, its atomic structure and properties, vibration and motion, its transformation and combination, as it exists in space and continues in time with its static and dynamic forces in the cosmic universe.

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